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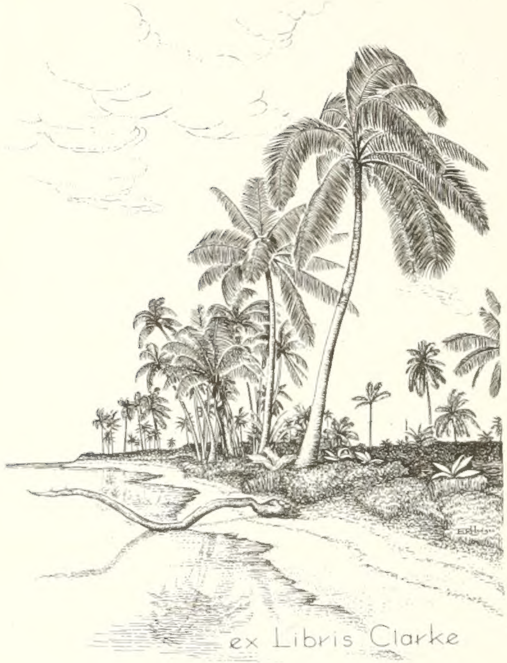
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PROVINCE OF BRITISH COLUMBIA.

REPORT

OF THE

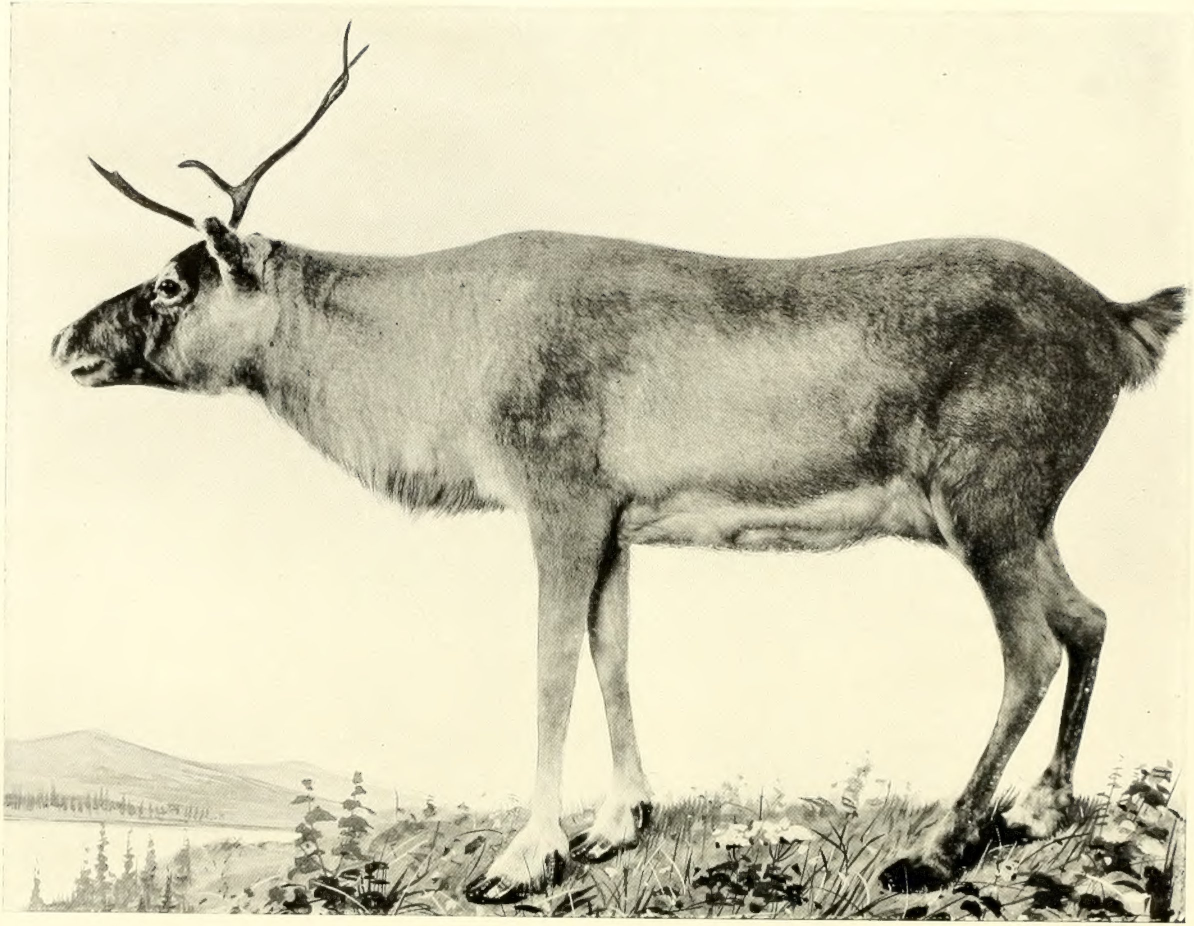
PROVINCIAL MUSEUM

FOR THE YEAR 1912.

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1913.



QUEEN CHARLOTTE CARIBOU (*Rangifer dawsoni*, Seton-Thompson).
Virago Sound, Queen Charlotte Island, November, 1908.

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1912-23

PROVINCE OF BRITISH COLUMBIA.

Ent.

Provincial Museum of
Natural History and
Anthropology, Victoria.

REPORT, 1912-1923,

OF THE

PROVINCIAL MUSEUM

FOR THE YEAR 1912.

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1913.-1924

SMITHSONIAN
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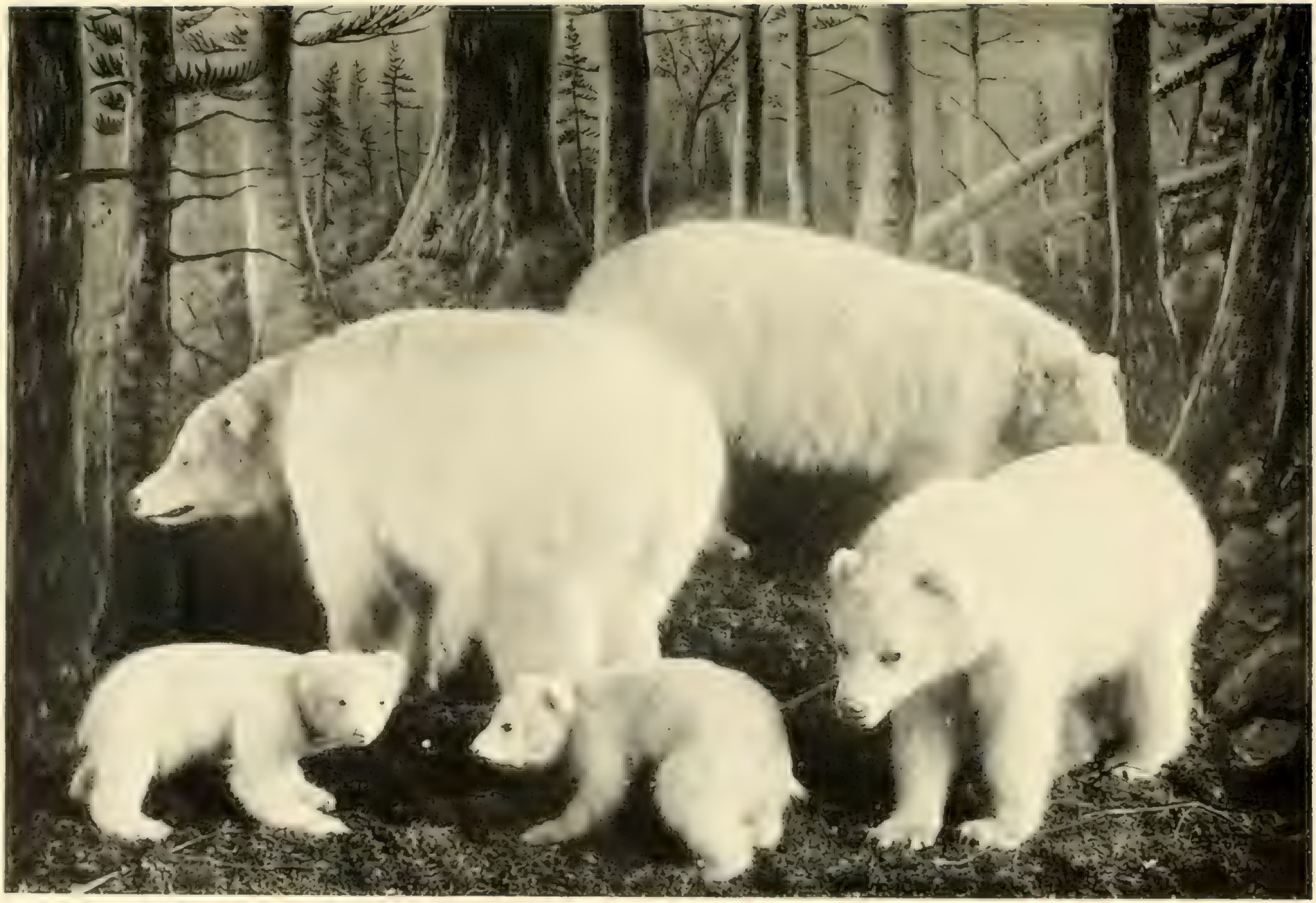
LIBRARIES

Provincial Museum,
Victoria, B.C., February, 1913.

The Honourable H. E. Young, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Curator of the Provincial Museum, to lay before you the report for the year 1912, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,
FRANCIS KERMODE,
Curator.



KERMODE'S WHITE BEAR (*Ursus kermodei*, Hornaday)
(Type Specimen.) Group in Provincial Museum, Victoria, B.C.

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1912.

Early in January the interior of the Museum was painted and thoroughly renovated; this was badly needed, and was made more necessary on account of having to move the bird-cases from the walls in order to make more space to accommodate four new bird-cases, which were made under the supervision of the Government carpenter on the premises.

The new arrangement of the cases on the upper floor made considerably more room, and I consider the arrangement much better. The collection of birds was thoroughly gone over, rearranged, labelled, and a large number of specimens added. Several new mammals have also been added to the ground-floor, and a large number of heads have been mounted and hung on the walls, of which some are records.

At present all the specimens in the Museum are too overcrowded to allow visitors to properly inspect them, and I have had to defer the mounting of any more mammals or groups until such time as we have space; therefore, most of the work performed in the workshop at present is confined to preserving the specimens and placing them in storage (which is also limited).

During the spring I made a trip to the interior and secured heads of the local mammals; a number of these were mounted and hung on the walls at the Government House by request of His Honour the Lieutenant-Governor. A collection of heads is also in preparation for the Agent-General's office in London, which will be of great interest and value to British Columbia.

The correspondence in the Curator's office is increasing, and keeps in touch with all the leading museums.

A great many applications have been made by school-teachers (more especially in the United States) for copies of the Natural History Bulletins to be used in their nature studies. Considerable correspondence is carried on with the people of the Province in regard to our native fauna.

A number of books and pamphlets have been received for the Museum Library from various museums in the United States and the United Kingdom, referring to the study of natural history in all its branches.

Dr. C. F. Newcombe has continued his research, and also in collecting anthropological material relating to the aboriginal races of the Province, and has secured a large collection of specimens (which have been placed in storage), together with data of the various tribes. The Anthropological Department is at present receiving special attention, before it becomes too late to gather all the material and information relative to the Indians of British Columbia (which at one time was a great race). I would like to suggest, if it were possible to interest a few, if not all, of our road foremen, surveyors, and engineers in construction camps, that they look out for archæological specimens and forward them to the Provincial Museum; their doing so would greatly assist us in our efforts to retain for this Province valuable specimens, which otherwise may be taken out and lost to us for ever.

The Provincial Museum has been very fortunate in having the co-operation of two of the experts from the Smithsonian Institution at Washington, D.C.—N. Hollister, of the Division of Mammals, and J. H. Riley, of the Division of Birds—who accompanied Director A. O. Wheeler, of the Alpine Club of Canada, on an expedition to the Yellowhead Pass and

Mount Robson region in the summer of 1911. A small appropriation was made to Director Wheeler, who had offered to look after specimens for the Provincial Museum. I met the party on their return to Edmonton, Alberta, and arranged with Messrs. Riley and Hollister that, after they had taken the collection to the Smithsonian Institution and examined the specimens, they would send a report on the birds and mammals of that district, also to send the Provincial Museum duplicates of the birds and mammals collected.

The reports have been received, also the specimens, several of which are new species, being described by N. Hollister.

E. M. Anderson, Assistant Curator, was Acting-Curator from May to August, during the Curator's visit East and to Europe, who had gone to study plans, arrangement, and management of the larger institutions of America and Europe, in preparation for the new Museum to be built in Victoria, and also to attend the annual meeting of the American Association of Museums.

The first museum visited was the Field Museum of Natural History at Chicago; second, the Smithsonian Institution and National Museum at Washington, where considerable time was spent in going over the vast collections, also through all the departments of the Biological Survey. I was loyally received and entertained and extended every privilege by the Secretary, Dr. Chas. D. Walcott, Mr. Rathbun, Dr. Merriam, Director Henshaw, and others of the staff of the Smithsonian Institution.

From Washington I proceeded to New York City, and attended the meeting of the American Association of Museums, held June 4th to 7th, 1912, in the lecture-room of the American Museum of Natural History. The meetings were presided over by the President, Prof. Ed. S. Morse, of the Peabody Museum, Salem, Mass. The address of welcome was delivered by Prof. Henry Fairfield Osborn, President of the American Museum of Natural History; followed by the roll-call, eighty-four members answering their names, being representatives from nearly all the leading museums in America.

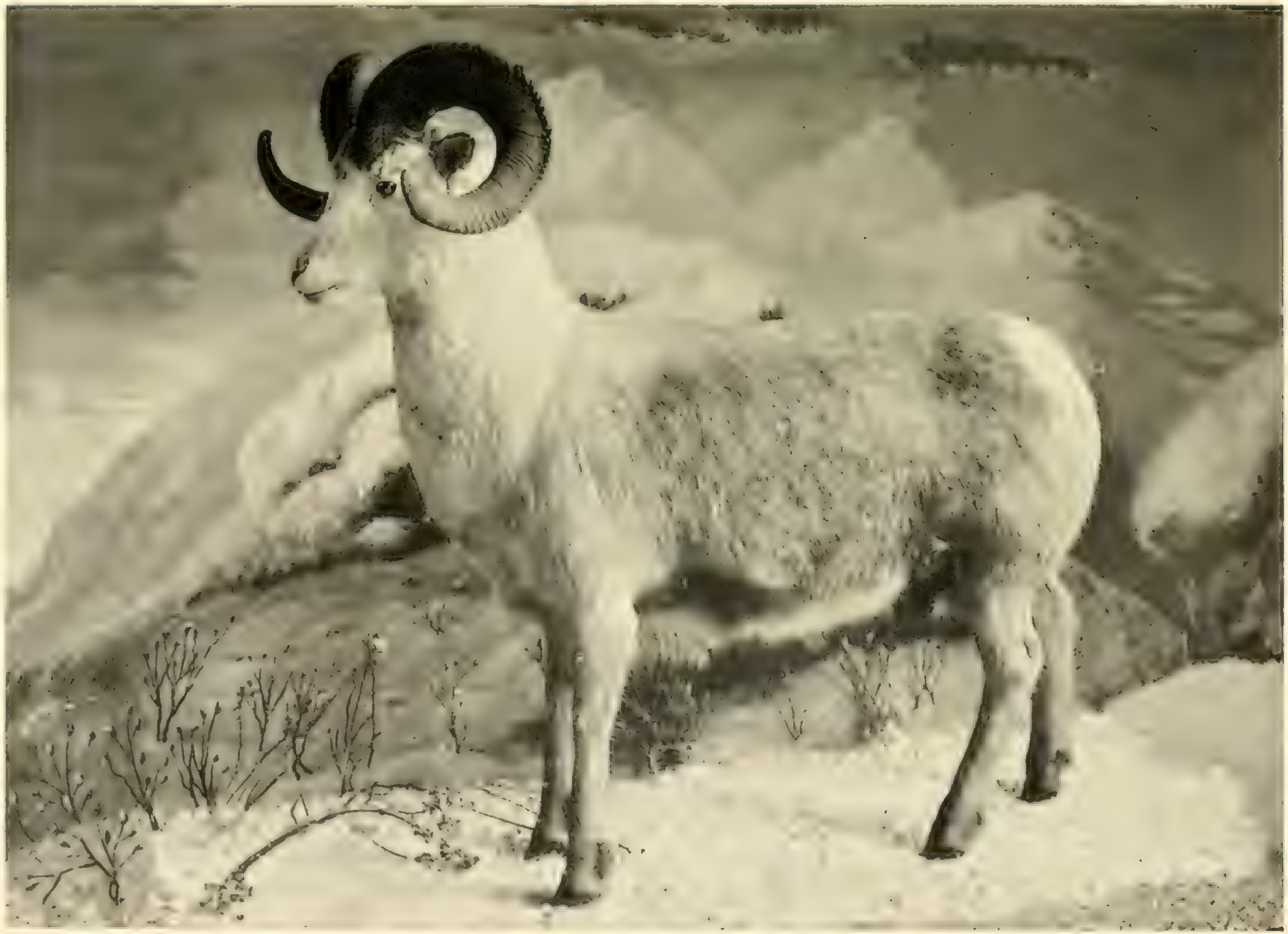
Papers were read on care, management, preservation of specimens, and other matter relating to museum-work, and discussions after each. Upon invitation, meetings were held at the Metropolitan Museums of Art, and also at the Museum of the Brooklyn Institute.

After each meeting sufficient time was given for the inspection of the collections, offices, and laboratories.

Previous to the meeting of the Association of Museums, I visited the American Museum of Natural History, and was well received by Dr. Lucas, the Director, and personally conducted by him over that magnificent institution, and was given a great amount of information in regard to the Museum and museum-work.

After the Association of Museums adjourned, I left New York for London, England, and there visited the Natural History Museum and other museums, and was received by Director Fletcher and Prof. Lydekker. I inspected the vast collection of valuable material to be seen in the institution. While in London I received an invitation from the Right Honourable Lord Pontypridd, President of the National Museum of Wales, at Cardiff, through Dr. Hoyle, the Director, to be present at the laying of the foundation-stone of the new National Museum in that city by His Majesty King George the Fifth on July 26th, 1912.

The ceremony took place in the presence of nearly three thousand people, representing all classes of the community and all parts of the principality. His Majesty's gracious words in reply to the loyal address presented to him, the interest he displayed in the details of the model, and his remarks to the officers of the Museum gave abundant evidence of his cordial approval of the enterprise and his desire for its success. The proceedings were carried out in the brilliant sunshine, and gave full satisfaction to all concerned.



FANNIN'S MOUNTAIN SHEEP (*Ovis fannini*, Hornaday.)
(Type Specimen.) Provincial Museum, Victoria, B.C.

The Council was specially gratified by the friendly interest manifested in the event by kindred institutions both in the British Isles and abroad. The American Museum of Natural History, New York, honoured the Museum by sending over its Director, Dr. Lucas, to represent it at the ceremony, and the Metropolitan Museum of Art, New York, appointed Dr. Ed. Robinson and Mr. W. R. Valentiner to attend on its behalf. Dr. C. W. Beebe, the Curator of Birds, represented the New York Zoological Gardens, and Mr. F. Kermode, the Provincial Museum, Victoria, B.C. Sir Cecil Harcourt Smith and Mr. C. E. Fagan represented the Victoria and Albert Museum and the British Museum respectively. Heads of many other kindred institutions in England also attended, including Dr. W. M. Tattersall, Manchester; Mr. T. Sheppard, Hull; Alderman J. Fuller Eberle (Chairman of the Museum Committee); Mr. H. Bolton; and Mr. R. Quick, of Bristol.

At the ceremony I met the Director of the Bristol Museum, Mr. H. Bolton, who visited the Provincial Museum with the British Association when they came to America for their meeting, extending their trip to British Columbia. Upon invitation of Director Bolton and Mr. J. Fuller Eberle, the Chairman of the Board of Directors of the Bristol Museum, I visited Bristol and received a cordial welcome, and was shown considerable material of interest regarding museum-work. After leaving Bristol I visited the Natural History Museums in Paris, Frankfurt, Berlin, and Hamburg, on the Continent, which were of great interest to me as one who is interested in the condition of the educational value of an up-to-date museum. From Hamburg I went to Edinburgh, Scotland, and visited the Royal Scottish Museum, and was taken over the collection by the Director, Sir T. Carlow Martin, LL.D.

Leaving Edinburgh, I went to Liverpool and visited the Natural History Museum under the direction of Dr. J. A. Clubb.

On my return to Canada I visited the Museums at Quebec and Ottawa.

In conclusion, I may say that, having been permitted by the Government to visit these large institutions of the world, it has been a great education to me, and I hope that when the new Museum is built I shall be able to carry out some of the ideas that I have formed of what an educational museum should be, and also what it means to the community at large.

The Provincial Museum has been honoured by the visits of several leading men in science, who expressed themselves as deeply interested in what they inspected, and that the Provincial Museum had exceeded all their expectations as a Provincial collection.

Dr. A. R. Crook, Director of the Illinois State Museum of Natural History, whom I met at the meeting of the American Museums Association, and who has since visited our Museum, had nothing but praise, and said that it was the finest local collection he had ever seen.

The most distinguished personages who visited the Museum were the Royal party, Their Royal Highnesses the Duke and Duchess of Connaught and Princess Patricia, who spent some time in going over the collection, and expressed admiration of the big-game and anthropological collections.

Attendance.

The attendance showed a slight increase over 1911—37,897 visitors signing the register. I venture to say that, on an average, about one in five of the travelling public insert their names in the book.

The Museum is open to the public (free) every week-day (except New Year's Day, Good Friday, and Christmas) from 9 a.m. to 5 p.m., and on Sunday afternoons, from the first Sunday in May to the last Sunday in October, from 1 p.m. to 5 p.m.

ACCESSIONS TO THE PROVINCIAL MUSEUM DURING 1912.

BIRDS.

White-tailed Ptarmigan (*Lagopus leucurus*), male and female, Barkerville, B.C., C. W. Grain, January 5th, 1912.

California Partridge (*Callipepla californica*), Cadboro Bay, E. M. Anderson, January 9th, 1912.

Reeves Pheasant (*Phasianus reevesii*), Nanaimo, B.C., Dr. Brown, January 29th, 1912.

Oregon Ruffed Grouse (*Bonasa umbellus sabini*), female, Mount Skirt, Goldstream, E. M. Anderson, February 1st, 1912.

Marbled Murrelet (*Brachyramphus marmoratus*), Saanich, B.C., J. R. Anderson, March 6th, 1912.

Sooty Grouse (*Dendragopus obscurus fuliginosus*), two males, Shawnigan Lake, E. M. Anderson, March 22nd, 1912.

Sooty Grouse (*Dendragopus obscurus fuliginosus*), female, Shawnigan Lake, E. M. Anderson, March 22nd, 1912.

Sharp-shinned Hawk (*Accipiter velox*), Victoria, Dr. Hasel, March 26th, 1912.

Mongolian Pheasant (*Phasianus torquatus*), male, Vancouver, A. Bryan Williams, March 28th, 1912.

Trumpeter-swan (*Olor buccinator*), Kamloops, Mr. Pearce, March 29th, 1912.

Red-backed Rufous Humming-bird (*Selasophorus rufous*), New Westminster, J. D. McDonald, August 14th, 1912.

Pigeon Guillemot (*Cepphus columba*), Victoria, P. Walker, August 19th, 1912.

Dark-bodied Shearwater (*Puffinus griseus*), Sidney Williams, Sidney, B.C., October 19th, 1912.

Ring-neck Pheasant (*Phasianus torquatus*), Cedar Hill, near Victoria, E. M. Anderson, November 21st, 1912.

Golden Pheasant (*Thaumalea picta*), Saanich, E. Wall, December 12th, 1912.

Cackling-goose (*Branta canadensis minima*), female, Parksville, H. Rawlins, December 1st, 1912.

California Murre (*Uria troile californica*), two males, three females, Saturna Island, F. Kermode and P. Walker, December 10th, 1912.

Ancient Murrelet (*Synthliboramphus antiqus*), four specimens, Saturna Island, F. Kermode and P. Walker, December 10th, 1912.

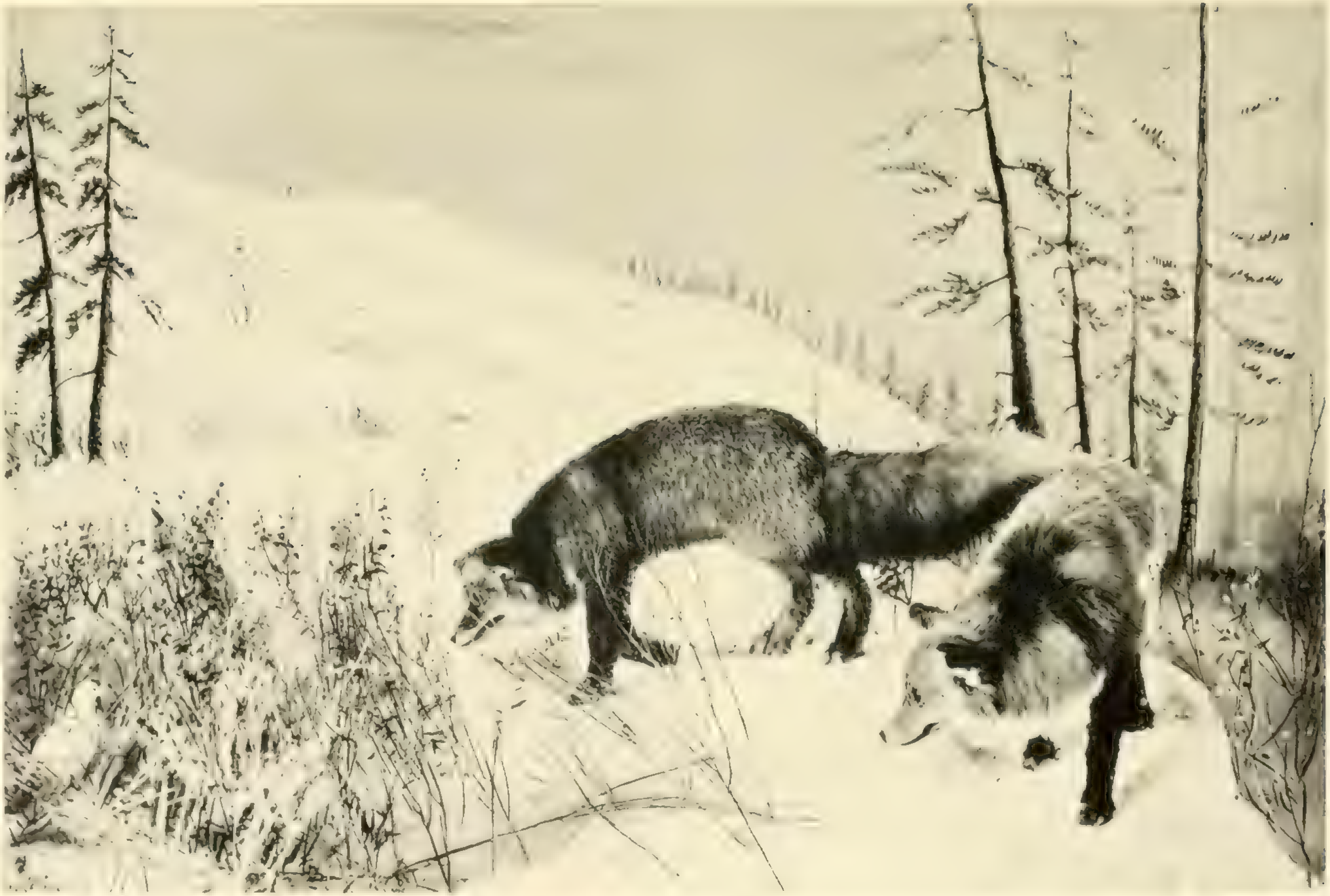
Hooded Merganser (*Lophodytes cucullatus*), female, Parksville, B.C., H. Rawlins, December 12th, 1912.

Hooded Merganser (*Lophodytes cucullatus*), female, Saturna Island, F. Kermode and P. Walker, December 10th, 1912.

American White Pelican (*Pelecanus erythorhynchos*), Prince Rupert, W. H. Sherman (purchased), December 20th, 1912.

BIRD-SKINS PRESENTED BY UNITED STATES NATIONAL MUSEUM, AUGUST 10TH, 1912 (J. H. RILEY).

Steller's Duck (*Eniconnetta stelleri*), male and female.
White-tailed Ptarmigan (*Lagopus leucurus*).
Franklin's Grouse (*Canachites franklini*), young.
Clarke's Nutcracker (*Nucifraga columbiana*).
Steller's Jay (*Cyanocitta stelleri*).
Alaskan Jay (*Perisoreus canadensis fumifrons*).
Rocky Mountain Jay (*Perisoreus capitalis*).
Desert Sparrow-hawk (*Falco sparverius phalœna*).
Lewis' Woodpecker (*Asyndesmus torquatus*).
Western Robin (*Merula migratoria propinqua*).
Red-winged Thrush (*Hylocichla aliciæ*).
Russet-backed Thrush (*Hylocichla ustulata*).
Olive-backed Thrush (*Hylocichla ustulata swainsonii*).
Olive-sided Flycatcher (*Contopus borealis*).



BRITISH COLUMBIA RED FOX (*Vulpes alascensis abietorum*, Merriam)

Western Wood Pewee (*Contopus richardsonii*).
Least Flycatcher (*Empidonax minima*).
Western Flycatcher (*Empidonax difficillis*).
Hammond's Flycatcher (*Empidonax hammondi*).
Traill's Flycatcher (*Empidonax trailli*).
Say's Phœbe (*Sayornis saya*).
Black Phœbe (*Sayornis nigricans*).
Bohemian Wahwing (*Ampelis garrulus*).
Long-tailed Chicadee (*Parus atricapillus septentrionalis*).
Mountain Chicadee (*Parus gambeli*).
Western Warbling Vireo (*Vireo gilvus swainsonii*).
Tennessee Warbler (*Helminthophila peregrina*).
Lutescent Warbler (*Helminthophila peregrina*).
Pileolated Warbler (*Wilsonia pusilla pileolata*).
Macgillivary's Warbler (*Geothlypis tolmiei*).
Black-throated Grey Warbler (*Dendroica nigrescens*).
Audubon's Warbler (*Dendroica auduboni*).
Long-tailed Chat (*Icteria virens longicauda*).
American Pipit (*Anthus rubescens*).
Pine Siskin (*Spinus pinus*).
Greenland Redpool (*Anthus hornemannii*).
Redpool (*Anthus linaria*).
Oregon Towhee (*Pipilomaculatus oregonus*), male and female.

MAMMAL-SKINS FROM UNITED STATES NATIONAL MUSEUM.

(Collected by Hollister and Riley in the Yellowhead District.)

6	Chipmunk (*Eutamias ludibundus*).
2	Northern Chipmunk (*Eutamias borealis*).
2	Chapman's Leeming Vole (*Synaptomys chapmani*).
6	Drummond's Meadow Vole (*Microtus drummondi*).
6	Cantankerous Meadow Vole (*Microtus mordax*).
1	Richardson's Meadow Vole (*Microtus richardsonii*).
6	Hudson Bay Chicaree (*Sciurus hudsonicus*).
7	Red-backed Vole (*Evotomys saturatus*).
2	Dusky Shrew (*Sorex obscurus*).
2	Masked Shrew (*Sorex personatus*).
4	Spermophile (*Callospermophilus tescorum*).
1	Chief Pika (*Ochotona princeps*).
5	Northern Field-mouse (*Peromyscus borealis*).
6	Field-mouse (*Peromyscus artemisæ*).
3	Rocky Mountain Jumping Mouse (*Zapus princeps*).
1	Mountain Vole (*Phenacomys species?*).

MAMMALS.

Vancouver Chicaree (*Sciurus hudsonicus vancouverensis*), male and female, Cedar Hill, near Victoria, E. M. Anderson, January 16th, 1912.
White-tailed Deer (*Odocoileus virginianus*), male, Elko, B.C., C. J. Lewis, January 16th, 1912.
Fannin's Sheep (*Ovis stonei*), male, Carcross, Y.T., Colonel Conrad (purchased), September, 1912.
Black-tailed Deer (*Odocoileus columbianus*), male, Cumberland, B.C., killed and presented by Robert Grant and S. Shaw, November 9th, 1912; weight, 200 lb.
Wild-cat (*lynx rufa*), three purchased from W. Lindley, Victoria, April 2nd, 1912.
Flying Squirrel (*Sciuropteras alpinus kalmathensis*), Broadwater, B.C., A. Campbell, December 11th, 1912.

Oology.

During the year 130 specimens of birds' eggs have been added to the collection, comprising twenty-seven species, twelve new to the collection.

A fine series of eggs collected at Salt Lake by Dr. David Moore Lindsay was sent in exchange for duplicates in our collection, viz.:—

1 Least Tern (*Sterna antillarum*).
3 Common Tern (*Sterna hirunda*).
4 American White Pelican (*Lelecanus erythrorhynchos*).
8 White-faced Glossy Ibis (*Plegadis guarauna*).
10 Snowy Heron (*Ardea candidissima*).
12 Black-crowned Night Heron (*Nycticorax nycticorax nævius*).
25 American Avocet (*Recurvirostra americana*).
20 Black-necked Stilt (*Himantopus mexicanus*).
4 Wilson's Snipe (*Gallinago delicata*).
8 Kildeer (*Ægillitis vocifera*).
3 Snowy Plover (*Ægillitis nivosa*).
9 Brewer's Blackbird (*Scolecophagus cyanocephalus*).
4 Sage Thrasher (*Oroscoptes montanus*).

North-west Crow (*Corvus Caurinus*), five in set, Victoria, E. M. Anderson, May 9th, 1912.

Gairdner's Woodpecker (*Dryobates pubescens gairdneri*), six in set, Victoria, E. M. Anderson, May 9th, 1912.

Sooty Grouse (*Dendragopus obscurus fuliginosus*), six in set, nest also contained three eggs of California Partridge (quail), Cedar Hill, S. Whittaker, May 10th, 1912.

Parkman's Wren (*Troglodytes ædon Parkmani*), seven in set, Cedar Hill, D. Irving, June 12th, 1912.

Northwestern Flicker (*Colaptes cafer saturatior*), seven in set, Cedar Hill, D. Irving, May 26th, 1912.

Western Chipping Sparrow (*Spizella socialis arizonæ*), four in set, Cedar Hill, D. Irving, May 26th, 1912.

Nuttall's Sparrow (*Zonotrichia leucophrys nuttallii*), four in set, Cedar Hill, D. Irving, June 4th, 1912.

Nuttall's Sparrow (*Zonotrichia leucophrys nuttallii*), five in set, E. M. Anderson, Victoria, May 19th, 1912.

Western Vesper Sparrow (*Pooecetes graminius confinis*), four in set, C. de B. Green, June, 1912.

Alaskan Yellow Warbler (*Dendroica æstiva rubiginosa*), four in set, Cedar Hill, D. Irving, May 26th, 1912.

Alaskan Yellow Warbler (*Dendroica æstiva rubiginosa*), five in set, Victoria, E. M. Anderson, May 19th, 1912.

Brewer's Blackbird (*Euphagus cyanocephalus*), six in set, C. de B. Green, June 11th, 1912.

Sage Thrasher (*Oroscoptes montanus*), C. de B. Green, nest and eggs, four in set; presented June, 1912.

Vigor's Wren (*Thryomanes bewickii spilurus*), D. Irving, five in set, Cedar Hill, July 12th, 1912.

Fishes.

Wolf Eel (young), Victoria, April 23rd, 1912.

Acrotus willoughbi, Victoria, July 19th, 1912; cast up on the beach; J. Dixon. purchased (fourth specimen known to science).

Char, Dolly Varden Trout (*Salvelinus malma*), Lorne Creek, August 7th, 1912, E. B. Earle (G.T.P.).

Miscellaneous.

Crawfish, Sooke, B.C., April 23rd, 1912.

Clam (*Glycerimis generosa*), Tofino, W. W. Rhodes, June 18th, 1912.

Rattlesnake (*Crotilus lucifer*), Ashcroft, H. Collins, May 10th, 1912.

Whale (*fœtus*), Victoria, B.C., Dr. Milne, December, 1912.

ANTHROPOLOGY OF BRITISH COLUMBIA.

Specimens collected by C. F. Newcombe, M.D., 1911.

Nootkan.

Harpoon-bag.
Cherry-bark.
Spear-bag.
Nose-pendant.
Halibut-hook.
Twisted gut.
Dentalia.
Pine-gum.
Doctor's head-dress.
Grease ladle strainer.
Belt.
Hook.
Wedge.
Wedge.
Awl.
Chisel, bone blade.
Mask, thunderbird.
" " female.
Carved birds with same (37).
Adze.
" handle carved.
" "
Fish gaff.
" lure.
" with hooks.
Cradle shape.
Bark-chopper.
Mat-maker's rubber.
" "
Hammer-stone.
Cradle of wicker.
Pads and bedding for same.
Whale-harpoon, small.
Elk-skin lashings.
Whale-harpoon, etched barbs.
Ceremonial bucket.
Rattle.
Thunderbird.
"
Mat-needles.
Cedar-twig lashings.
Whaler's charm.
Herring-net.
Tongs.
Hammer-stone.
Whale-harpoon.
Harpoon point, short line.
" head.
Totem-pole, Ohiat.
"
Totem-pole, Sarita.
"
Painted board, Sarita.

Bone spear, model.
" club, "
Whistle.
Drum-sticks.
Baler, carved.
Halibut-club.
"
Mask, Hai-ot-lik.
Spear-point, iron.
Pecten rattle.
Apron of cedar-bark.
Dentalium spear.
Hook-basket.
Basket and lid.
Dagger.
Net.
Coloured wool mat.
Chief's stick.
Anchor-stone.
Chief's bag of fibre.
Chisel.
Bark cradle.
Chest, carved, large.
Spinning disk.
Mat, rubber.
Adze.
Arrow, large, old.
" " "
Bailer.
Netting implements.
Chisel, old compound.
Maul.
Paddle.
Maul.
Native wool blanket.
Spoon.
Maul.
Slate knife, mounted.
Fish-club.
Wicker basket.
Woman's awl, bone.
Adze, D-shaped.
Basket.
"
Tump-line.
Basket, chip.
Mask, double.
Box.
Bow.
Quiver.
Arrow.
"
"

Nootkan.—Concluded.

Arrow.
Nettle fibre.
Spoon, wood.
Wedge.
Hammer.
Fish-gaff.
Bow.
Tackle-box.
Hook-bag.
Tackle-box.
Whale of wood.
Whistle of yew.
Large bag.
Skull charm.
Mask.
"
Sea-lion harpoon.
Whetstone.
Clam-dish.
Mat (bedding).
" "
" floor.

Nootkan (Uclulet).

Mask.
"
Fish-lure.
Panther mask.
Doctor's head-dress.
Cradle of wood.
Bird rattle.
Board mask.
Panther-claws.
Scallop rattle.
Bone fish-knife.
Harpoon-socket (antler).
Skin hook-bag.
Seal-skin and frame.
Whaler's belt.
Box.
Mask.
Bird rattle.
Whaler's charms.
Hook-bag.
Mask.
"
Mat, cradle, etc.
Bone adze-handle.

Kwakiutl.

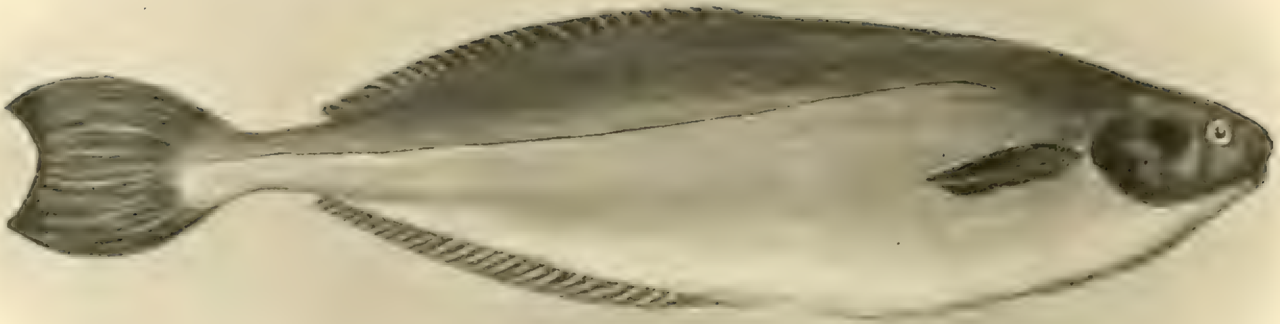
Dish.
"
"
"
"Fool" mask.
Mat.
Whale mask.
Cannibal bird mask.
Box.
Killer-whale dish.
" "
" "
Bear dish.
Beaver dish.
Stone hammer.
Chief's head-dress.
Potlatch figure.
" ladle.
Cannibal's rattle.
Goose mask.
Star "
Sun "
Potlatch dish.
" "
Carved seat, chief's.
Sea-otter tooth lid.
Loom.
Box.
Stone maul and handle.
Stone maul.
Tomahawk of stone.
Stone adze and handle.
Spindle, wood.
" bone.
Spoon, carved.
Soapberry spoons.
Straining-basket.
Potlatch figure.

Salish.

Infusorial earth.
Stone hammer.
Pitted stone hammer.
Rattle, bird-shaped.
Net, nettle thread.

Dene (Chilcotin).

Basket, small.
" "
" large.
" "
Basket, large.
" "
" "



WILLOUGHBY'S RAG FISH (*Acrotus willoughbyi*, Bean
Victoria, B.C. July 1912. Two brown specimens

Haida.

"Copper" beaver crest.
Monument.
Carved sea-lion heads.
Eagle-whale mon't.
Sea-otter spear.
Halibut-hook, carved.
Sea-otter spear.
Black-cod kelp lines.
Set black-cod hooks.
Fisherman's basket.
Case of berry-spoons.
Chief's crest coat.
Halibut-line of spruce.
Carved stone maul.
Pestle-stone.
Stone adze.
Perforated stone.
Food-crusher.
Awl, canoe-maker's.
Canoe tackle-box.
Dance head-dress.
Spruce-root lashing.
Paddle.
Carved house-plank.
Halibut-hook, iron.
Stone mortar.
" war-club.
Tobacco-pestle.
"
Hand-hammer, very large.
Maul.
Stone labret.
Paint-stone.
Stone sinker.
Whetstone.
Stone chisel.
"
" (jade).
Knife-handle, carved.
Spoon mould and stick.

Sea-otter club.
" "
" bow.
Halibut-club, carved.
Fish hand-net.
Mesh-stick.
Salmon-spear points.
Hair-seal points.
Halibut-hook, carved.
" albatross.
" devilfish.
" puffin.
" albatross.
Tobacco-pestle.
Box of polished bones.
Halibut-float.
Dish, halibut.
" old type.
" seal pattern.
" very old.
" large, with cover.
Box, old, carved.
Berry-basket.
Spoon-basket.
Chief's head-dress.
Dance-blanket.
"
Carved canoe-dish.
Spear (devilfish).
Dish, line carving.
Chief's hat.
Raven mask.
Bear "
Mask.
Eagle mask.
Bear-skin robe.
Chief's chest (5 pieces).
Bone spearhead.
Model sail.
Large totem-pole.

Tsimshian.

Cradle.
Dance-hat, inlaid.
Maple-bark bag.
Stone club.
"
Stone club, Digby Island.
Mortar, grooved.
Skull.
"
"
" (fragment). } Gifts.
Femur.
Tibia.
Incised stone.

Carved stone horn.
Stone chopper.
Perforated stone fr.
Model bridge.
Loom.
Stone adze.
Salmon-spear.
Carved box.
Bark-chopper.
Berry-basket.
Totem-poles.
Doctor's crown.
Grooved stone.

SPECIMENS COLLECTED BY DR. C. F. NEWCOMBE, 1912.

Kwakiutl.

Carved stone axe, Rivers Inlet.
"   "   Cormorant Island.
Hat, Alert Bay.
"   "
Cannibal mask (3 heads).
"   "
"   "
Wolf mask, large female.
"
"
"
Wasp mask.
Wind "
Dsonoqua mask.
Bark collar.
"
"
"
"
Drum.
Baton.
"
"
"
Mountain-goat mask.
Killer-whale dish.
Killer-whale dish (tail back).
Wolf dish.
"
Wolf mask.
"
"
Heligia mask.
"
"
Rattle.
Wind mask.
Sisiutl belt.
Killer-whale dish.
Hamspiq.
Potlatch figure.
Small stone hammer.
Wedges.
Ladle, eagle.
" wolf.
" plain.
" with head.
Spindle whorls.
"
"
Comb.

Chilcotin.

Basket.
"
"
"
"
Basket.
"
"
"
Leggings, Tsimshian.

Nootkan.

Paddle.
"
Hook-bag.
Blanket, Tsimshian.
Wedge-basket.
Tool-box.
Chisel.
Adze.
Knife.
"
"
Bag for above tools.
Fish-trap.
Basket (open work).
" (close weave).
Spoon.
Nettle fibre.
Berry-cake.
Awl.
"
Harpoon-barbs.
Yellow-cedar bark.
"   "
"   " (small).
Cape, yellow cedar bark, half made.
"   "   " quarter made.
Yellow cedar string.
"   "
Seal-skin sturgeon float.
Sea-lion stomach oil-bag.
Hook-bag.
Arrows (4).
Rattle.
Bull roarers (2).
Bow, sea-otter.
Arrows (6).
Wedges (6) and basket.
Yellow cedar blanket and loom.
Bark strips.
"

Nootkan.—Concluded.

Medicine-bag of cedar-bark.
Dip-net and lure.
Medicine-bag.
Vegetable food.
Bow and arrows for birds.
Small mat.
Needle, bone.
Club, "
Adze, "
Carved "
Mask, "
Thunderbird (Macquiller).
Harpoon, etched barbs.
Whale charm, carved.
" "
Nettle fibre.
Stone hammer.
Mat.
"
War-club.
Carved bone.
Hat.
Basket.
Sea-otter arrow-box.
Tackle-box.
Club, dogfish.
Sea-otter spear.
Potlatch mask, man's face.

Rattle, skull.
" "
Whistle.
" (6), long.
Bear-skin on drying-frame.
Doctor's bark ring.
Slave-killer, model.
Dish, carved and painted whale.
Hamatsa's blanket.
" mask.
" leggings.
" armlets.
" apron.
" stomacher.
" collar.
" head-dress.
" whistles (12)
Box.
Arrows.
Box.
Blanket-pin, bone.
Bailer.
Sinker.
Stone hammer.
Seal dish.
Slave-killer, stone, broken.
Chief's grave crest and beam, Campbell River.

Tsimshian.

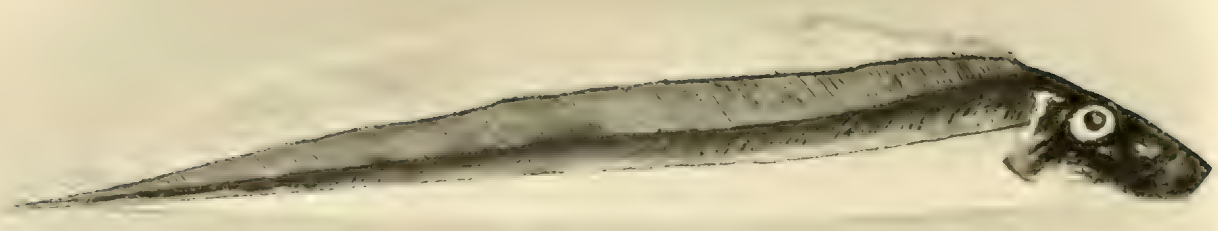
Mask, old, grouse.
" small human face.
" " "
" " "
" " "
" with frog.
" red-wing flicker.
" fool (1), bow (2), dagger (3).
" nigger (1), wooden spear (2).
" death's head (1), heart (2), owl (3).
Marmot-skin.
Salmon.
Spinning whorl.
Loom.
Paint-sticks for gambling set.
Gauge for "
Equisetum "
Arrow, club-shaped (cerem.).
Mask, monkey-face.
" crying woman.
" potlatch, man's face.
" white man.
" eagle.
" " opens out.
Chisel.
"
Slate mirror.

Food-tray.
" small.
Bag of cedar bark.
Mat "
Ladle.
"
Club, model of wood.
Charm, golden eagle.
Mask, doctor's.
" man's face.
" simple woman.
Seaweed chopping-block.
Chest, carved.
Feather-case.
Wolf crest of yew.
Hamatsa cedar-bark ring.
" " "
" " "
" " "
Hamatsa mask.
"
"
"
Bone-scraper.
Head of human figure.
Gambling-sticks.
Spindle-rest.

Tsimshian.—Concluded.

Chief's blanket.
Soapalali spoons.
Kingfisher, carved.
Halibut-hook.
"
"
Awl-point, bone.
Chisel-point, bone.
Bone awl.
"
Needles, long bone (16).
Bark-splitters, bone (3).
Short barbs and points (24).
Flat instruments (9).
Barbed points (2).
Antler " (2).
Harpoon-point, barbed.
" "
" "
" not barbed.
Harpoon-head, broken in three pieces.
Drinking-tube, bone.
Chisel, antler.
Sea-lion teeth (2).
Small teeth (3).
Beaver-tooth in jaw.
Slate instruments (6).
Spear-point, stone.
Chisel, small jade.
Stone, semicircular, perforated.
" grooved.
" drilled (sinker?).
Polishing-stone, curved.
Hammer, small-pointed.
Bark-chopper, stone.
" "
Whetstone, large.
Adze, stone.
Nodule, clay, etched.
Hand-hammer, flat oval, partly grooved.
" "
" "
" "
" "
" " plain.
" " "
" " double-pitted.
Maul, perforated.
Pestle, stone.
" "
" "
" "
" "
" "
" "

Pestle, stone.
" "
" "
" "
" "
Mortar, large-grooved.
" "
" plain.
" "
" fragment of.
" "
Whetstone.
"
"
"
Mirror, slate.
Rubbing-stone, red, oval.
" "
" "
" broken
Sinker, oval.
Rubbing-stone.
"
"
"
"
"
"
"
"
"
"
"
"
"
"
"
"
Spherical stone.
Stone, L-shaped.
" "
" "
Stone, hammer-shaped.
Stones, "
Stone, boomerang-shaped.
Skull.
"
"
Thigh-bone.
Stone disk.
Sinker, flat notched.
Rubbing-stone for bow-strings.
Chipped flint point
Large whale-bone.



KING OF THE SALMON (*Trachypterus rex-salmonorum*, Jordan and Gilbert)
Sherringham Point, Vancouver Island, 1907. Fifth known specimen

Salish.

Basket.
"
"
"
"
"
"
"
"
"
"
Snow-shoes.
Moccasins.
Adze-handle, carved.
Fish-spear.
Sturgeon-club.
Loom.
Spindle whorl.
"
Goat's wool in ball.
Totem-pole.
"
Mask from Comox
Hammer-stone.
"
"
"
"
"
"
"
"
"
"
"
Bow and arrows (4).
" " (3).
Rattles, leg and arm.
Hat.
Mat-creaser.

Mat-creaser.
Halibut-hook.
"
Bow-strings of sea-lion gut.
Spinning whorl and stick.
Wedge, elk-horn.
War-club, model.
River-canoe, model.
Lehal.
Slehallum.
"
Slate knife.
"
"
"
Slate spear-point.
Arrow-points (6).
Chisel, stone.
" "
" "
" "
" "
" "
" "
" "
" "
" "
Point, barbed, bone.
Sea-lion spear-point, iron and lanyard.
Perforated stone sinker.
Ladle of wood.
Spoon.
Mask.
Hair head-dress.
Beaver-tooth game.
" (1 missing).
Labret.
Sinker, oval stone.
Counters for gambling game.

SPECIMENS COLLECTED BY J. A. TEIT FROM THE INTERIOR OF BRITISH COLUMBIA, 1911-12.

Interior Salish (Ntlykyapamal, Countean, or Thompson Tribe).

22 lodge mats.
1 mat, rushes and rabbit-skins.
1 " " and bark.
1 bag, buckskin.
1 pair snow-shoes.
1 bag of hide.
1 bag, buckskin (beaded).
1 slipper, sage-brush bark.
1 pair buckskin moccasins.
1 cap, woman's, buckskin.
1 shirt, boy's, "
1 child's carrier of dressed moose-skin.
1 strap ornament.
2 boys' caps, skin.

1 man's bonnet, skin.
1 cape, buckskin.
2 spoons, juniper-bark.
1 spoon, horn.
1 charm.
1 necklace (bear-teeth).
1 " beads, etc.
1 " porcupine-quills.
1 " beads and dentalia.
2 arrows, wood.
9 chipped stones.
1 buckskin string.
1 girl's drinking-tube of lynx-bone.
1 " bone-scratcher.

Interior Salish (Ntlykyapamal, Countean, or Thompson Tribe).—Concluded.

1 spoon, sheep-horn.
1 bag.
1 " bark.
1 " hemp.
1 " fringed buckskin.
1 stone hammer.
1 basket, birch.
1 " circular tray.
1 " oblong.
1 " trunk.
1 parfliche.

Athapascan (Tahltan Tribe of the Nahanis).

1 game-bag of hide.
1 " netted.
1 pack-strap.
1 pair moose-skin moccasins.
1 pair moose-skin moccasins, quill-work.
1 necklace (dentalium shells).
1 hat-band, beaded.

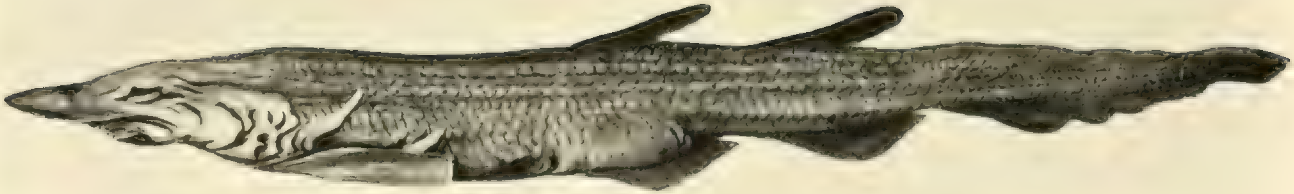
ENTOMOLOGY.

INSECTS COLLECTED BY E. M. ANDERSON, 1912.

Pontia occidentalis (Reak), May 29th, 1912.
Oenis gigas (Butler), Mount Finlayson, July 7th, 1912.
Samia rubra (Behr), Victoria, July 6th, 11th, 1912.
Telea polyphemus (several taken at night), Victoria, June and July, 1912.
Pseudohazis eglanterina (Bdv.), sheep-moth, Goldstream, June 2nd, 1912.
Apantesis ornata (Pack), Victoria, May 28th, June 7th, 1912. Var. *achaia* (G. & R.).
Apatela perdita (Grote), Victoria, May 24th, 1912.
Hadena cinefacta (Grote), Victoria, May 20th, 1912.
" *claudens* (Walker), Victoria, May and June.
" *cerviana* (Smith), Victoria, June 4th, 1912.
Polia epichysis (Grote), Victoria, May 17th, 1912.
Feralia columbiana (Smith), Victoria, May 2nd, 1912.
Rhynchagrotis costata (Grote), Victoria, June 19th, 27th, 28th, 1912.
Noctua inopinatus (Smith), Victoria, Aug. 3rd, 6th, 1912.
Paragrotis vestusta (Walker), Victoria, Aug. 10th, 1912.
" *titubatis* (Smith), Victoria, Sept. 11th, 1912.
" *satis* (Harvey), Victoria, Aug. 4th, 1912.
Autographa selecta (Walker) Victoria, July 9th, 1912.
Catocala elda (Behr), Goldstream, July 17th, 1912.
Erebus odora (Linn), Victoria, Sept., 1912.

In addition to the above list there has also been added the following:—

Coleoptera,	78	specimens.
Lepidoptera,	300	"
Hyemoptera,	24	"
Diptera,	38	"



BROWN CAT SHARK (*Catulus brunneus*, Gilbert)
Taken at Nanaimo, B.C. Three known specimens

PROVINCIAL MUSEUM LIBRARY—REPORTS AND PUBLICATIONS RECEIVED IN 1912.

Field Museum of Natural History, Chicago.

Publication 154—A Study in Chinese Archæology and Religion.
" 152—Antiquities from Boscoreale in Field Museum.
" 153—The Mammals of Illinois and Wisconsin.

Proceedings of the California Academy of Sciences.

Expedition of the California Academy of Sciences to the Galapagos Islands.
Notes on the Botany of Crocas Island.
The Grekos of the Galapagos Archipelago.
Notes on the Reptiles from Southern California and Arizona.
Notes on some Reptiles and Amphibians from Oregon, Idaho, and Utah.
Geologic Range of Miocene Invertebrate Fossils of California.

University of California Publications in Zoology.

The Horned Lizards of California and Nevada.
On a Lymphoid Structure lying over the Myelencephalon of Lepisostens.
The Living Eggs of Rats and Mice, with Description of Observance.
History of the Marine Biological Station of San Diego.
Oxygen and Polarity in Pubularia.
The Occurrence and Vertical Distribution of Copepoda.
Observations on the Suckling Period of the Guinea-pig.
Haeckels, Radiolaria—a Marine Ciliate.
Report on a Collection of Birds and Mammals on Vancouver Island.
A New Cony from the Vicinity of Mount Whitney.
The Mole of Southern California. A Bat new to California.
The Bighorn of Sierra Nevada.
A New Peroganthus from the San Joaquin Valley, California.
The Beaver of West Central California.
The Two-pocket Gophers contagious in California and Arizona to Colorado River.

Report of the Cooper Ornithological Club of California.

Birds of the Pacific Slope of Southern California.
A Systematic List of the Birds of California.

United States National Museum, Washington.

New Mammals from Eastern Panama.
New Sub-species of Monkey from British East Africa.
The Genera of Fossil Whale-bones allied to Balonoptera.
Notes on Animals in the National Zoological Park.
Further Notes on the Breeding of the Black Bear in Captivity.
The names of the Large Wolves of Northern and Western North America.
New Rodents from British East Africa.
The Recognition of Pleistocene Faunas.
Directions for preparing Specimens of Mammals.
New Mammals from Canada, Alaska, and Kamaschatka.
Description of Twelve New Mammals from Panama.
The Crustacea of the Order Cumacea in the United States National Museum.
Preservation of Osseus and Horny Tissues.
A Revision of the Forms of the Edible-nest Swiftlet, Collacelia fuciphage.
A Small Collection of Bats from Panama.
Description of a New Species of Isopod from Japan (2).
Variation in the Skull and Horns of "Isabella Gazelle."

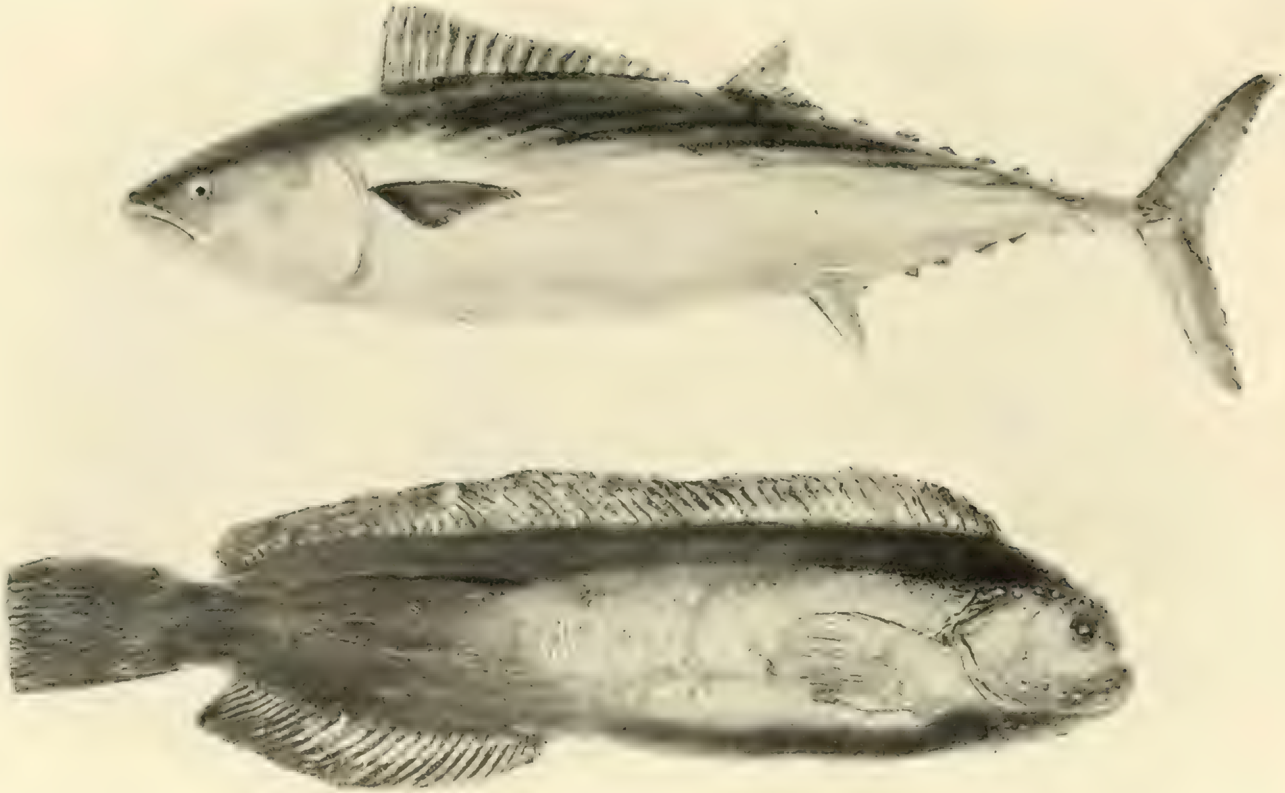
Instructions for collecting and fixing Rotifers in bulk.
Marine and Terrestrial Isopods from Jamaica.
A New Genus belonging to the Crinoid Family, Phrynocriniuidæ.
New Arenaceous Foraminifera from the Philippine Islands.
Descriptions of New Parasitic Copepods in the United States National Museum.
Diagnoses of New Barnacles from the Philippines and China Sea.
Description of a New Terrestrial Isopod from Panama.
A New Discodrilid Worm from Colorado.
Description of Two Parasitis Isopods from Panama.
A Revision of the Sub-species of the Green Heron.
Description of a New Species of Isopod from Ecuador.
Description of a New Family, etc., from Philippine Islands (Fishes).
Studies of Mexican and Central American Plants.
The Allioniacæ of Mexico and Central America.
A Monograph of the Forminifera of the North Pacific Ocean.
The Early Paleozoic Bryosoa of the Baltic Provinces.
Catalogue of Art Objects from the Freer Collection in United States National Museum.
New or Noteworthy Plants from Columbia and Central America.
The Gama-grasses, Bontelna and Related Genera.
Studies of Tropical American Ferns.
The North American Species of Nymphæa.
List of North American Land Mammals in the United States National Museum, 1911.
New Genera and Races of African Ungulates.
A Fossil Toothed Cetacean from California (New Species).
New Races of Insectivores, Bats and Lemurs from British East Africa.
New Mammals from the Highlands of Siberia.
Descriptions of the Alcyonaria collected mainly in Japanese Waters.
Preliminary Account of Medusæ from the Philippines.
Bryozoa from Labrador, etc., collected by Dr. Owen Bryant.
Notes on certain Amphipods from the Gulf of Mexico, with description.
The Crinoids of the Museum, Berlin.
Revision of the Forms of Great Blue Heron.
Proceedings of the United States National Museum, 1911.
" " " 1912.
Birds of North and Middle America, 1911.
Annual Report of the United States National Museum, 1911.

AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK.

A New Porpoise from Japan.
A Description of an Apparently New Porpoise, with Remarks upon Skull.
Mammals from Venezuela, collected by M. A. Carriker, 1909, 1911.
Mammals collected in the Dutch East Indies by Roy C. Andrews, 1909.
The Generic Name, Cercopithecus. Notes on North American Sheep.
Mammals from Western Columbia.
A New Pika from Colorado.
Scientific Results, Expedition Gulf of California (V. H. Townsend).
Diagnoses of apparently new Columbia Birds.
A New Ibis from Mt. Kenia, British East Africa.
A Revision of the Classification of Kingfishers.
Concealing Coloration, an Answer to Theodore Roosevelt.

THE CONDOR, A MAGAZINE OF WESTERN ORNITHOLOGY.

Another Fortnight on the Farallones.
The Shore Birds of Santa Barbara.
A Week Afield in Southern Arizona.
Some North-Central Colorado Bird Notes.
Birds of the Cottonwood Groves.
The Discovery of the Nest and Eggs of the California Pine Grosbeak.



BONITA (*Sarda chilensis*)

(Type Specimen.) PROW FISH (*Zaprora silenus*)

AGRICULTURAL EXPERIMENTAL STATION, OHIO.

Autumn Meeting of the Ohio State Horticultural Society.
Treatment of Artificial-tree Plantations.
Alfalfa in Ohio—a Field Study.
The Church Bug.
The Rural Population of Ohio (showing Increase and Decrease).
Varieties of Corn in Ohio.
Farm Poultry.
Co-operative Forestry Work.
Experiments on the Central Farm (Maintenance of Soil Fertility).
The Seed-corn Situation.
Testing the Dairy Cow.
Carriers of Lime.
Horticultural Information.
Apple-blister Canker, and Methods of Treatment.
Dressing for Pruning-wounds on Trees.
Farm Management, Field Studies, and Demonstration Work in Ohio.
Feeding Dairy Cows.
The Status of the Potato-growing Industry in Ohio.
Seasonal Notes on Potatoes.
Fall Manual of Practice in Aconomic Zoology.
Flour-mill Fumigation.
Climate of Ohio.
Strawberry Notes for 1910-11.
Tobacco-culture in Ohio.
Rejuvenation of Orchards.

UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON.

The Migratory Movements of Birds in relation to the Weather.
Our Mid-Pacific Bird Preservation.
Bird Enemies of the Codling-moth.
Craw-fish as Crop-destroyers.
National Reservation for the Protection of Wild Life.
Directory of Officials and Organizations *re* Birds and Game, 1912.
Report of the Condition of Elk in Jackson Hole, Wyoming, 1911.
Chronology and Index, Game Protection Act, 1776-1911.
Report of Expedition to Layson Island.
Annual Report of the Governor of Alaska on Alaska Game Law, 1911.
Common Mammals in Western Montana in relation to Agriculture.
The English Sparrow as a Pest.
Raising Belgian Hares and other Rabbits.
Some Common Game, Aquatic, and Rapacious Birds in relation to Man.
Farmers' Bulletin, 510.
Game Laws for 1912.

FIELD MUSEUM OF NATURAL HISTORY.

Annual Report of the Director to the Board of Trustees.
Mammals from Western Venezuela and Eastern Columbia.
Description of New Fishes from Panama.
The Oraibi Maru Ceremony, 1912.
Brief Miscellaneous Hopi Papers, 1912.

WILSON ORNITHOLOGICAL CLUB, OBERLIN, OHIO

A Study of the Home Life of the Brown Thrasher.
March Bird List from the Callosahatches River and Lake Okeechobee.
A Preliminary List of Birds of Fall River County, South Dakota.

PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAL ART.

The Frishmuth Antiquarian Collection.
Drawing-room Set of Furniture, Louis XVI. Period.
Two Additional Furniture Sections, opened to the Public, May 27th, 1912.
An Old Interior from the Austrian Tyrol.
General Ethnology Collection, E. W. Clark Collection.
One of the Oldest Babylonian Tablets in the World.
An Ancient Antiquary.

THE COLORADO AGRICULTURAL COLLEGE.

Bulletin, Colorado Climatology.
Deterioration of the Quality of Sugar-beets, due to Nitrates in the Soil.
The Ammonifying Efficiency of certain Colorado Soils.

THE DETROIT MUSEUM OF ART.

A Painting added to the Permanent Collection.
April Bulletin, Vol. 6.
Some Fine Acquisitions.

THE BRITISH MUSEUM OF NATURAL HISTORY

Guide to the Department of Zoology, 1910.
Guide to the Animals, etc., mentioned in the Bible.
Guide to Smith's Drawings of Mushrooms.
Memorials of Charles Darwin, 1910.
Guide to the Crustacea, etc., 1910.
General Guide to the British Museum of Natural History, 1909.
Guide to the Exhibited Series of Insects, 1909.
Guide to the Shell and Starfish Galleries, 1908.
Guide to the Great Game Animals (Ungulata), 1907.
Guide to the Coral Gallery, 1907.
Guide to the Gallery of Reptila and Amphibia, 1906.

THE CARNEGIE MUSEUM, PITTSBURG.

Report of the Carnegie Museum, 1911.
Report of the Founder's Day, and Annual Report, 1912.

MISCELLANEOUS REPORTS.

State Museum University of Washington, Seattle, 1912.
Wisconsin Natural History Society, 1911.
Report of the University Museum, Michigan, 1911.
The Louisiana Museum.
Bulletin No. 1, Leguminosae of Louisiana, 1910.
City of Milwaukee Public Museum.
Annual Reports of the Oakland Free Library and Oakland Museum, 1911-12.
The Oologist—Birds, Nests, Eggs, December, 1911.
The Mineral Resources of the Philippine Islands.
American Association of Museums.
New York Zoological Society, New Blood Pheasants.
Report of the Drexel Institute and Library School.
The Tahltan Indians, University of Pennsylvania.
Educational Appliances for the Instruction of Natural History.
University Studies of the University of Nebraska (4 reports).
University of California in Zoology, Vol. 8, No. 3.
Augustana Library, Rock Island, Ill., No. 7.
Report, Wagner Free Institute of Science, Philadelphia, 1911-12.
Report, Erie Public Library, Pa., 1909-10-11.
California University, Birds in relation to Grasshoppers.

California University, Structure and Relationships of D. palustris.
California University, Birds of Oregon, 1907-8.
Studies in Bird Migration.
Park Museum Bulletin, March and April, 1911.
Some Aspects of Variation, 1912.
Bristol Art Gallery Catalogue.
Wilson Bulletin, Ohio, No. 81.
Report of the Natural History Museum, Illinois, 1909-10.
American Journal of Science, Showers of Meteoric Stones, etc.
State Board of Agriculture, Mass., Report of State Ornithologist.
A Preliminary List of the Insects of Quebec.
Guide to the Collections, Free Public Museums, Liverpool.
Annual Report of the Public Museum of Milwaukee.
Some Poultry Diseases, Colorado Agricultural College.
Geology of the Sangamon County.
Report of the Brooklyn Entomological Society.
Report of the New Jersey Agricultural Experimental Stations.
Report of the Pennsylvania Museum and School of Art.
Report of the Museum of Natural History, University of Michigan.
General Guide to the Museum of Natural History, University of Michigan.
Report of the Brooklyn Museum of Arts and Sciences.
The Mineral Resources of the Philippines for 1911.

CANADIAN REPORTS.

Report of the Anthropological Division, Canada Department of Mines.
Summary Report of the Geological Survey, 1911-12.
Report of the Bighorn Coal Basin, Alberta.
Report of Southern Vancouver Island.
The Geology and Ore Deposits of Phœnix, Boundary District, B.C.
Preliminary Report of the Clay and Shale Deposits of Western Provinces.
Report of the Commission *re* Turtle Mt. and Frank, Alta.
The Geology of Steeprock Lake, Ont.

MANCHESTER MUSEUM, ENGLAND.

Report of the Manchester Museum for 1895 to 1912, inclusive.
Notes on Suggestions for a Proposed Museum in Manchester.
Notes on Rachiopteris cylindrica (Will.).
Notes on Ampullæ in some Specimens of Millepora.
Notes on New Species of Brachiopoda and Mollusca of Lancashire.
Notes on Palæontology of the Manx Slates of the Isle of Man.
Xenophyton radiculosium (Hick) and Stigiuarian Rootlet.
The Red-sandstone Rocks of Peel, Isle of Man.
The Carboniferous Perunan and Triassic Rocks in Glacial Drifts.
Report on Bigbury Camp and Pilgrim's Way.
Notes on the Type Specimen of Loligoeblanae (Ball).
Discovery of Elephas antiquois at Blackpool.
Diagnostic Key to Dibranchiate cephalopoda.
Two Native Rag-branches and a Prayer-stick.
The Education of a Curator.
Glue and Turpentine Cement for Alcoholic Mounts, how to make and use.
Nomenclature of the Seams of Lancashire Coal-measures.
Hadfield Collection of Shells from the Loyalty Islands.
Catalogue of the Library.
Index to the Systema Nature of Linnæous.
Correlation Tables of British Strata.
Palaeontology of the Lancashire Coal-measures (Part 1).
" " " (Part 2 and 3).
A Brief Account of the Cosuro Melvill Hebarium.

Chapters from the Evolution of Plants.
Catalogue of Hepaticæ.
Handy Guide to the Museum.
The Marine Molusca of Madras.
Marine Shells from Lively Island, Falklands, and other Parts.
General Guides to the Natural History Collections.
Descriptive Catalogue of the Embryological Models.
Catalogue of Egyptian Antiquities of the XII. and XVIII. Dynasties.
Outline classification of the animal kingdom.
The Tomb of Two Brothers.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1913.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1913

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
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1914.

Glacier, south end of Atlin Lake, B.C

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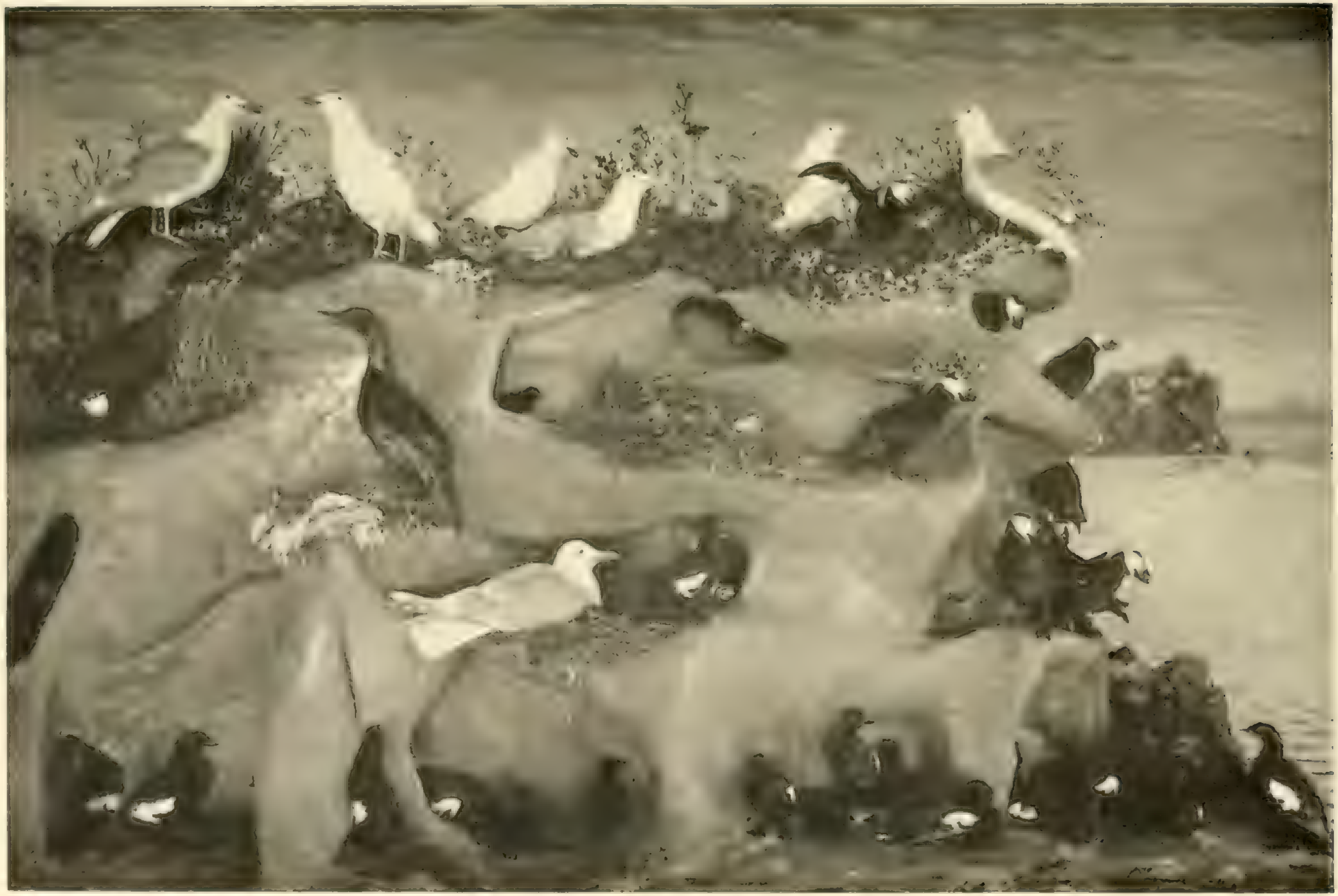


Group in the Provincial Museum representing a section of Bare Island, Straits of Georgia, B.C.

Birds included are Tufted Puffins, Pigeon Guillemots, Glaucous-winged Gulls, and Violet-green Cormorants, that nest on Bare Island during the months of June and July. It is proposed to make this Island a Bird Sanctuary.

To His Honour THOMAS WILSON PATERSON,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History for the year 1913.

HENRY ESSON YOUNG,
Provincial Secretary.

Provincial Secretary's Office, January 15th, 1914.

Provincial Museum of Natural History,
Victoria, B.C., January 15th, 1914.

The Honourable H. E. Young, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum, to lay before you the report for the year 1913, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

ERRATA.

Page 5, line 25.—For "batrachins" read "batrachians."

Page 19.—For "Reptila" read "Reptilia."

Page 22, line 6.—For "Buffalo-head" read "Buffle-head."

Page 26, top line.—For "Kwakiult" read "Kwakiutl."

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1913.

Provincial Museum,
Victoria, B.C., December 31st, 1913.

The Honourable H. E. Young, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—The work of the Provincial Museum of Natural History during the past year has been more extensive in its scope, and, I believe, more productive in results which are calculated to advance and serve the purposes of popular instruction, than in any preceding year. It is gratifying to note that the earnest and persistent efforts made during the past years have won the generous and appreciative recognition not only of scientific men, but of the general public, and that our institution as a Museum of Provincial Natural History and Anthropology is recognized as one of the foremost of its kind.

There is no way of accurately recording the attendance, but a glance at the visitors' register shows the names of people from all parts of the world. Only a very small proportion of persons visiting the Museum utilize the register, 33,896 only having recorded during 1913. Several classes from the public schools under the direction of their teachers have visited the Museum, and I think that, if other teachers would take an opportunity of bringing their classes to visit the Museum, it would be of great benefit to the students in their nature-studies.

It has been the endeavour of the Director to make every dollar of expenditure tell in the direction of increasing the extent and value of the possessions of the Museum.

Considerable scientific research has been carried on in the field during the year, and the Director proposes to continue this work and have parties in the field each year until every portion of the Province has been covered; the country offering almost unlimited opportunities for the enthusiastic collector.

On April 7th, E. M. Anderson, of the Museum staff, accompanied by an assistant, C. B. Garrett, were sent afield to make a general collection of zoological specimens in the Okanagan Valley from the south end of Okanagan Lake to the United States boundary. Many valuable specimens were added to the Museum, several species being new to the collection. During the three months' trip there were collected: 306 birds, 580 oological specimens (comprising 114 sets of eggs with nests), 278 mammals, 36 batrachins and reptiles, 11 fishes, and over 4,000 entomological specimens.

Special attention was given during the year to our collection of fishes. An interesting and beautiful series of casts has now been arranged in eight cases on the upper floor in the north section of the Museum. These casts, carefully coloured, represent the salmon family in both salt-water and spawning forms, and other fishes indigenous to the waters of the Province. In addition to the above, many new specimens have been preserved in alcohol, and the whole collection of fishes rearranged.

During the months of May and June the Director, accompanied by an official of the Provincial Secretary's Department, made several week-end trips to Bare and Saturna Islands, and secured some very interesting material.

The Director has this year taken up with more activity the question of the preservation of wild life, and having the permission of the Honourable H. E. Young, M.D., Provincial Secretary and Minister of the Department, invited the Royal Commission on Indian Affairs for the Province of British Columbia to visit Bare Island, an Indian reserve, which has been proposed as a bird sanctuary. The invitation was accepted, the launch "Gunhild" chartered, and the trip taken on July 4th. The Commission was greatly impressed with what they saw of the bird-life on this island, and negotiations are now in progress with the Department of Indian Affairs at Ottawa to have Bare Island made a permanent bird sanctuary for the preservation of wild life.

Dr. C. F. Newcombe has continued his work of collecting anthropological material and data relating to the Coast tribes, and has secured a large number of rare and valuable specimens, one of which is a large board sail, which I believe is the first that has been secured by any museum. Dr. Newcombe's report is annexed hereto.

Mr. J. A. Teit, of Spences Bridge, has also continued the work of collecting anthropological material from the Interior tribes, and has been very successful in securing a great deal of wearing-apparel, baskets, etc.

Dr. Newcombe having been employed by the Fisheries Department to carry on investigations regarding the life-history of sea-lions, the Director left Victoria on June 17th for Namu, to accompany him to the rookeries in the Sea Otter Group, south-west of Cape Calvert. On arriving at Namu on the 20th, the launch "Chaos" was chartered and left the same evening for Cape Calvert. On the way down Fitzhugh Sound, about 9.30 p.m., when nearing Safety Cove, the "Karluk" on her way north, with the Steffanson Arctic Expedition on board, was passed. Early next morning a start was made round Sorrow Island and Cape Calvert, out to sea in a south-westerly direction to Devil and Pearl Rocks, which are about seven miles offshore. On approaching Devil Rock only a few sea-lions were found, probably about 200, but at the next point visited, Pearl Rocks, which is the main rookery, the number estimated was 1,500 males and females and about 500 pups. In an endeavour to secure specimens several shots were fired, but when hit the animals would roll off the rocks into the sea and sink almost immediately. One large male, however, was secured before it sank, and was towed back to Grief Bay, a distance of seven miles, where it was hauled up as the tide came in, to be skinned and prepared for transportation. This mammal measured 11 feet 6 inches in length and 8 feet 6 inches around the neck, and weighed about 2,500 lb. Several good photographs were secured, showing the rocks inhabited by these large sea-mammals. Early the next morning Pearl Rocks were revisited, and subsequently Watch Rock, where approximately 500 males and females, including pups, were observed. Bird Rock, which is nearer the shore-line of Calvert Island, was also visited. This is a small island, chiefly rock, where a number of glacous-wing gulls and cormorants nest, and should be set aside as a bird sanctuary; the birds on this island are not found in any such numbers as on Bare Island, near Victoria.

On August 30th the Director and his assistant left Victoria for Atlin on a general zoological collecting trip. Although in the Atlin country only during the month of September, a considerable number of specimens were collected, several of which were not previously known to be in the Province. When it becomes possible to again visit this district and do a full season's field-work, there can be no doubt that a number of eastern and northern species will be found within the limits of British Columbia.

In a Province possessing such an enormous coast-line, the study of marine biology is of very great importance, but so far our efforts in this direction have been handicapped by the lack of suitable means for carrying out the work. Systematic dredging along the coast must be undertaken by means of a suitable vessel. It is generally to be hoped that in the near future it will be found possible to obtain a launch for the use of the Department, in order that this important branch of our institution may not be neglected. A suitable boat would be of very great assistance also in obtaining data relating to the migration of sea-birds and the nesting habits, and would afford an opportunity of visiting certain little-known islands which contain material of the greatest value and interest to the Provincial Museum.

Annexed will be found a complete list of all new specimens secured during the year.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

Nest and eggs of the Glaucous-winged Gull. Bare Island, near Victoria, B.C

Nest and Eggs of Black Oyster-catcher, Bare Island, near Victoria, B.C

REPORT ON BIRDS COLLECTED AND OBSERVED DURING APRIL, MAY, AND JUNE, 1913, IN THE OKANAGAN VALLEY, FROM OKANAGAN LANDING SOUTH TO OSOYOOS LAKE.

By E. M. Anderson.

(Note.—Species collected on the trip are marked with an asterisk.)

*Holbœll's Grebe (*Colymbus holbœlli*, Reinh.).

Common on all the lakes throughout the valley; breeds on Dog, Vaseaux, and Osoyoos Lakes. Eggs taken on June 11th and 16th. Nests found floating in the tule marshes and also on the margin of lakes, composed of dead rushes, grasses, etc., and lined with decayed vegetation—in about 3 feet of water. Eggs, four or five whitish buff to pale green, often stained to obscure the ground colour; size, 2.20 x 1.45.

*Horned Grebe (*Colymbus auritus*, Linn.).

Fairly common on lakes. Nests found well hidden amongst tules in about 4 feet of water. Three sets of eggs taken June 13th at Vaseaux Lake. Nest composed of rushes, etc., and lined with decayed vegetation. From five to eight buffy white eggs, often pale greenish; size, 1.50 x 1.25. Birds seldom found near the nests, as the eggs are incubated chiefly by the action of dead vegetation placed in the nests.

Loon, Great Northern Diver (*Gavia immer*, Brun.).

A pair were found on all the larger lakes throughout the valley. On May 23rd, secured an interesting set of eggs at Vaseaux Lake; the nest was situated at the water's edge, on the extreme point of a small island. Eggs two in number, of a dark greenish-brown colour, spotted sparingly with black. One egg measured 2.20 x 3.15, the larger 4.40 x 2.50; the latter a most remarkable-sized egg.

Herring-gull (*Larus argentatus*, Pont.).

One seen at Okanagan Lake on April 9th.

Merganser (*Mergus americanus*, Cassin.).

One pair seen at Okanagan Lake on April 12th; probably breeds.

Mallard (*Anas platyrhynchos*, Linn.).

On April 10th a large flock of about sixty birds was seen near Penticton, along the Okanagan River. By the 20th of the month nearly all of the birds paired and bred on the numerous lakes throughout the district.

Red-head, Pochard (*Marila americana*, Eyt.).

A few pair were seen with a large flock of scaup-ducks at Okanagan Landing on April 15th. A pair bred on Dog Lake, near the Okanagan Falls. The young were seen on June 12th close to the margin of the lake.

Scaup-duck, Bluebill (*Marila marila*, Linn.).

Common at Okanagan Falls on April 9th. Did not find it breeding in the valley.

Lesser Scaup-duck (*Marila affinis*, Eyt.)

Five birds seen in company with scaup-ducks on April 9th at Okanagan Landing.

Buffle-head, Butter-ball (*Charitonetta albeola*, Linn.).

Two males seen at Okanagan Lake on April 9th.

Canada Goose (*Branta canadensis canadensis*, Linn.).

Found throughout the valley. Three were seen at Penticton on April 12th; about forty at Vaseaux Lake on May 12th. Breeds throughout the valley. On an island in Vaseaux Lake two nests were found on the ground. They lay five beautiful eggs; size, 3.45 x 2.40. Nests composed of pin-needles, lined with down. Birds have been known to nest at the edge of American osprey's nest, and not uncommonly on top of a pinnacle of a mountain-top.

TRUMPETER-SWAN (*Olor buccinator*, Rich.).

Two birds were seen at Dog Lake, near Kaleden. These birds were moving northward to their breeding-grounds. S. Satow reports the bird common at Vaseaux Lake during the winter months.

BITTERN (*Botaurus lentiginosus*, Montag.).

By no means a common bird; only three pair seen. A pair was found breeding at Vaseaux Lake on June 8th; nest in the marsh. Two birds seen at Osoyoos Lake on May 10th, and also a pair observed on wing along the Okanagan River on June 25th.

SANDHILL-CRANE (*Grus mexicana*, Muller).

Two flights of about one hundred birds moving northward seen on Schoonover Mountain, April 18th to 20th. One pair breeding at Vaseaux Lake, May 23rd.

VIRGINIA RAIL (*Rallus virginianus*, Linn.).

Found on Dog Lake, Okanagan Falls, May 2nd, breeding in reeds.

CAROLINA RAIL (*Porzana carolina*, Linn.).

One pair seen at Vaseaux Lake, May 23rd, breeding in tules.

COOT (Mud-hen), (*Fulica americana*, Gmel.).

Common at Okanagan Lake, Penticton, April 10th to 15th. Breeds on lakes throughout the valley. Eggs laid in marshes.

WILSON'S SNIPE (*Gallinago delicata*, Ord.).

One pair observed on May 10th at Dog Lake, Okanagan Falls.

*GREATER YELLOW-LEGS (*Totanus melanoleucus*, Gmel.).

A fine male taken on a small lake near Fairview on May 15th.

*SPOTTED SANDPIPER (*Actitis macularia*, Linn.).

Common, breeds throughout the valley. Seen at Vaseaux Lake on May 20th, Dog Lake on June 15th; two birds shot at Penticton along the river-bank on June 25th. This is the only species of sandpiper observed with certainty in the valley.

LONG-BILLED CURLEW (*Numenius americanus*, Bech.).

Not common. On May 8th a pair were seen on a side-hill on Shuttleworth Creek. A pair bred at Vaseaux Lake on the west side. Birds heard, May 25th to 30th; nest not found.

*KILDEER PLOVER (*Oxyechus vociferus*, Linn.).

Fairly common in suitable breeding-places. Taken on May 10th at Okanagan Falls. Seen at Vaseaux Lake on June 1st, at Dog Lake on June 20th.

CALIFORNIA QUAIL (*Lophortyx californica californica*, Shaw.).

Saw two pair at Penticton with young brood on June 28th. Settlers report the bird increasing throughout the district.

*RICHARDSON'S GROUSE (*Dendragapus obscurus richardsoni*, Dougl.).

Common in nearly all the foot-hills. Secured birds at Penticton on April 10th; Okanagan Falls, Schoonover Mountain (4,000 feet), April 18th to 25th. Found nest containing six eggs near the top of Schoonover Mountain, about 4,500 feet; nest on ground under small pine tree. Eggs hard set on June 2nd; size, 1.90 x 1.30; buff coloured, spotted with brown.

FRANKLIN'S GROUSE (*Canachites franklini*, Dougl.).

Two birds were seen on April 9th at Four-mile Creek, Penticton, at an altitude of about 3,000 feet. These birds breed on Mount Pearson and most of the high mountains throughout the valley. R. D. Sullivan reports it breeding back of Summerland at about 4,000 feet.

*GREY RUFFED GROUSE (*Bonasa umbellus umbelloides*, Dougl.).

Abundant in different sections. Common along the river-banks and alder bottoms; also found in mountains in suitable places, along creeks, edges of lakes, etc. Secured several fine specimens during May. Found a nest on May 3rd placed on the ground, composed of dead leaves. The five eggs measure 1.60 x 1.20, pale-buff colour. Eggs fresh when taken.

Bird-nesting on [illegible] Island

The eggs of the Northwest Coast Heron were taken from the nest near the top of this tree.

Ring-neck Pheasant (*Phasianus torquatus*, Linn.).

A few were seen at Okanagan Falls. J. Thomas reports the birds doing well, and it is to be hoped that they will endure the winter months.

*Mourning-dove (*Zenaidura macroura carolinensis*, Linn.).

Very abundant from Penticton to Osoyoos Lake. Observed on May 24th at Vaseaux Lake, May 16th at Osoyoos, and all through June at Okanagan Falls. Breeds throughout the valley commonly; nest usually placed on the ground, laying two white eggs; size, 1.15 x 0.80.

Turkey-vulture (*Cathartes aura septentrionalis*, Wied.).

Very common from Vaseaux Lake to Osoyoos; breeds in rugged cliffs from May to July.

Marsh-hawk (*Circus hudsonius*, Linn.).

Saw one bird at Osoyoos Lake on May 16th. One pair were found breeding at Vaseaux Lake on June 10th amongst the tule marshes and grasses.

*Sharp-shinned Hawk (*Accipiter velox*, Wils.).

One specimen taken near Fairview on May 19th. Not a common breeder in the district.

*Cooper's Hawk (*Accipiter cooperi*, Bonap.).

Found a pair breeding at Shuttleworth Creek, Okanagan Falls, on May 3rd. Nest composed of sticks and lined with bark strips, etc., was placed in poplar tree, about 30 feet up. The eggs, two in number, of a bluish-white colour, spotted slightly with brown; size, 1.90 x 1.40. Eggs fresh.

Goshawk (*Astur atricapillis atricapillus*, Wils.).

One pair seen at Shuttleworth Creek, Okanagan Falls, on April 18th.

Western Red-tailed Hawk (*Buteo borealis calurus*, Cass.).

Not common. Saw one bird at Okanagan Falls on May 25th, and another pair at Schoonover Cabin, 3,500 feet altitude.

Swainson's Hawk (*Buteo swainsoni*, Bonap.).

Only one specimen seen at Shuttleworth Creek, Okanagan Falls, on May 20th.

Golden Eagle (*Aquila chrysætos*, Linn.).

Not common. One pair found breeding at MacIntyre Creek, nest inaccessible on rugged cliff, May 10th.

Bald Eagle (*Haliaëtus leucocephalus alascanus*, Towns.).

One pair seen on May 5th at Okanagan Falls.

*Duck-hawk (*Falco peregrinus anatum*, Bonap.).

On May 12th found a pair breeding on the south side of Peach Cliff, Okanagan Falls; nest situated in a crevice of an inaccessible bluff, about 500 feet from the ground. Secured both male and female in full breeding plumage.

Black Pigeon-hawk (*Falco columbarius suckleyi*, Ridg.).

Not a common bird. Observed one at Okanagan Falls on May 8th, and one at Vaseaux Lake on June 1st.

*Desert Sparrow-hawk (*Falco sparverius phalæna*, Lesson).

Common. Breeds throughout the valley; nests in holes in trees. Okanagan Falls, May 8th; Osoyoos, May 16th; Penticton, June 26th.

*Osprey (Fish-hawk), (*Pandion haliætus carolinensis*, Gmel.).

Abundant. Penticton, May 12th; Okanagan Falls, April, May, and June. Breeds commonly: nests tops of trees from 50 to 80 feet high. Three sets of eggs taken. Okanagan Falls, set of three, May 12th; Osoyoos Lake, set of two, May 15th; and Vaseaux Lake, set of three, May 20th. Size of eggs, 2.55 x 1.95, whitish, blotched with chestnut brown.

*Long-eared Owl (*Asio wilsonianus*, Less.).

Breeds fairly commonly in old crows' nests in bottom lands. Male and female and five downy young taken on small island in Vaseaux Lake on May 23rd.

DUSKY HORNED OWL (*Bubo virginianus saturatus*, Ridg.).

One seen on April 12th at Four-mile Creek, near Penticton, and another at Okanagan Falls on May 3rd. Breeds throughout the district.

BELTED KINGFISHER (*Ceryle alcyon*, Linn.).

Found breeding along the river-banks and Vaseaux Lake. Nest contained seven young on June 24th, in a hole in the bank at Penticton. Fairly common.

*NORTHERN HAIRY WOODPECKER (*Dryobates villosus leucomelas*, Bodd.).

One female taken at Shuttleworth Creek, Okanagan Falls, on May 7th. Not common.

*CABINIS' WOODPECKER (*Dryobates villosus hyloscopus*, Cab. & Heine).

Fairly common in the hills. Four specimens taken at Schoonover Mountain, Okanagan Falls—one April 19th, one April 25th, one May 7th, and another June 7th.

*BATCHELDER'S WOODPECKER (*Dryobates pubescens homorus*, Cab. & Heine).

Fairly common. Taken at Okanagan Falls on May 13th.

*RED-NAPED SAPSUCKER (*Sphyrapicus varius nuchalis*, Baird.).

Four specimens taken at Penticton on June 25th. Not common. Breeds near Penticton, along the Okanagan River banks; nests in alder-stumps. Birds located feeding young, June 22nd.

*WILLIAMSON'S SAPSUCKER (*Sphyrapicus thyroideus*, Cass.).

Rare in British Columbia. Male and female taken on April 22nd on Schoonover Mountain, Okanagan Falls, about 3,500 feet, and a single male on June 1st in the same locality. The hammering of this bird differs in sound from any other of the woodpecker family, being faster and shriller, not unlike that of a nuthatch, but heavier taps and more pronounced. All three were found feeding on tamarack-trees.

NORTHERN PILEATED WOODPECKER (*Phlœotomus pileatus abieticola*, Bangs).

Not common. Breeds at Okanagan Falls. Pair seen at McLean Creek on May 1st.

*LEWIS' WOODPECKER (*Asyndesmus lewisi*, Riley).

Common from Okanagan Falls to Osoyoos. Breeds commonly. Nests in holes in stumps, etc., laying from seven to nine eggs, white, measuring 1.05 x 0.80. Eggs taken at Vaseaux Lake on May 31st and June 10th.

*RED-SHAFTED FLICKER (*Colaptes cafer collaris*, Vigors).

Common throughout the valley. Breeds commonly. Nests in old stumps, etc., from 10 to 20 feet high. Birds and eggs taken at Vaseaux Lake on May 27th and June 10th. Lay from six to eight white eggs, measuring 1.20 x 0.90. The male bird was sitting on the eggs. Bird shot.

POOR WILL (*Phalænoptilus nuttalli nuttalli*, Aud.).

Only one seen at Vaseaux Lake on June 5th. Heard notes of the bird at Penticton on June 26th.

*WESTERN NIGHT-HAWK (*Chordeiles virginianus henryi*, Cass.).

Very abundant at Okanagan Falls on June 29th, and also at Penticton from June 25th to July 1st.

BLACK SWIFT (*Cypseloides niger borealis*, Kenn.).

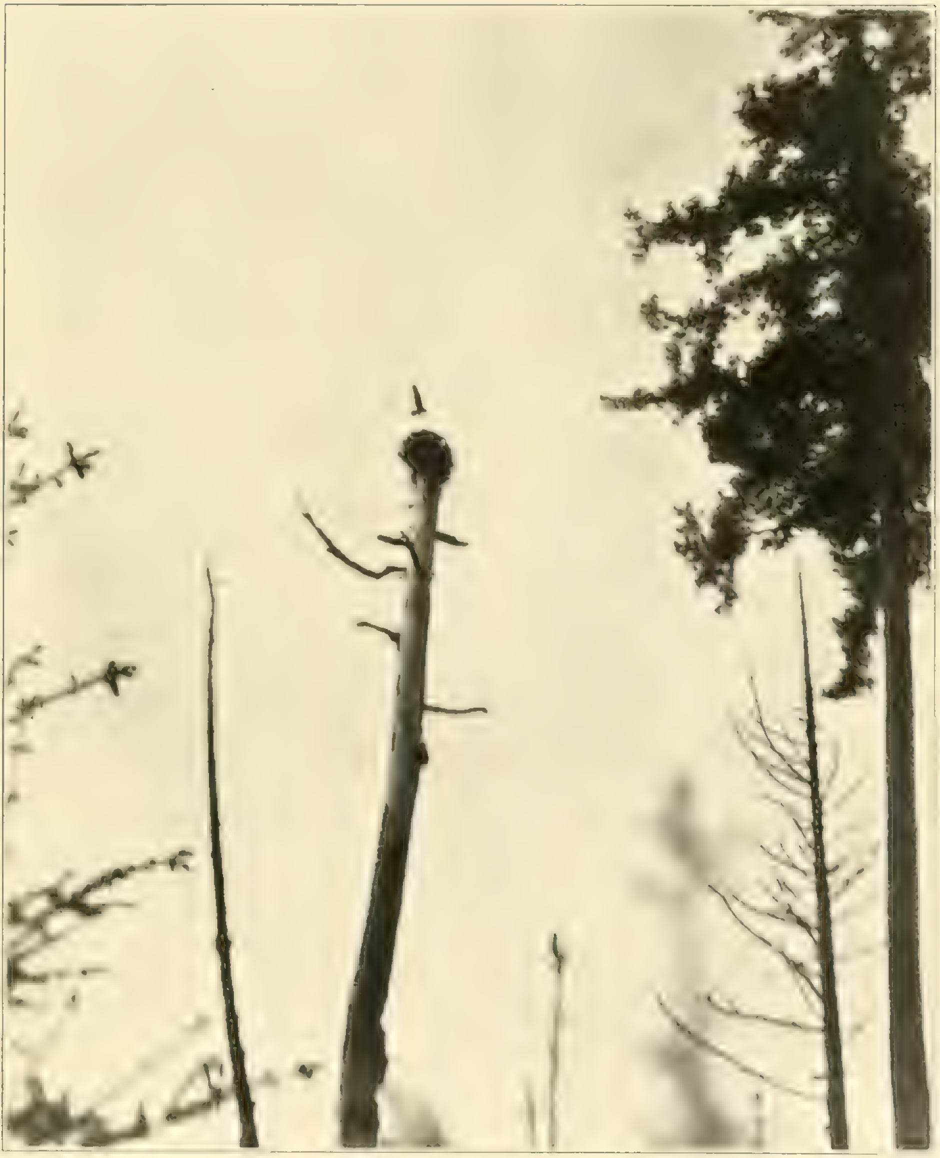
On July 2nd, while travelling on the train, observed a flock of about thirty birds on the wing a mile north of Mara.

VAUX'S SWIFT (*Chætura vauxi*, Towns.).

Fairly common at Okanagan Falls on May 20th; also a pair on Okanagan River, about two miles north of Penticton, June 26th; the latter pair were breeding. Observed the birds breaking rotten sticks from a dead birch whilst on the wing. This performance was noticed only late in the evening, usually about an hour before dusk.

CALLIOPE HUMMING-BIRD (*Stellula calliope*, Gould).

One male seen at Shuttleworth Creek on May 15th at an altitude of about 3,000 feet.



Osprey and nest at top of a dead fir, Saturna Island, Straits of Georgia, B.C.

*Rufous Humming-bird (*Selasphorus rufus*, Gmel.).

By no means as common as on the Coast. A few seen at Okanagan Falls from May 3rd to 30th, and at Penticton from June 20th to 30th.

*Kingbird (*Tyrannus tyrannus*, Linn.).

One of the commonest birds of the valley, arriving about the middle of May and breeding in June. Nests and eggs taken at Vaseaux Lake, June 11th and 15th; Penticton, June 20th, 25th, and 28th. Nests in bushes and tops of posts, etc. Lay from three to four cream-coloured eggs, blotched and spotted with brown and lilac, measuring 0.95 x 0.75.

*Arkansas Kingbird (*Tyrannus verticalis*, Say).

Very abundant in the valley. Breeds commonly. Found nest in stable containing three young on May 3rd at Okanagan Falls, and a second nest with fledglings on June 11th at Shuttleworth Creek in a pine-tree close to the trunk, about 30 feet high.

*Say's Phœbe (*Sayornis sayus*, Bonap.).

Two specimens taken in sage-brush at Penticton on April 10th, and another at Okanagan Falls on May 5th. Breeds.

*Olive-sided Flycatcher (*Nuttallornis borealis*, Swains.).

One seen at MacLean Creek on May 8th. A male taken at Schoonover Mountain on June 6th, altitude 3,500 feet. By no means a common bird.

*Western Wood-pewee (*Myiochanes richardsoni richardsoni*, Swains.).

Fairly common at Osoyoos, May 16th; Vaseaux Lake, May 24th; and Penticton, June 25th. Breeds.

*Traill's Flycatcher (*Empidonax trailli trailli*, Aud.).

Common. Nests and eggs taken at Penticton on June 16th. Nests placed in rose-bushes about 4 feet from the ground, composed of fine grasses and wood-fibre, lined with cow and horse hair. Lay from three to four eggs, cream coloured, spotted and blotched with lilac and brown, mostly towards the larger end. Measure, 0.75 x 0.55. (Eggs perfectly fresh.)

*Hammond's Flycatcher (*Empidonax hammondi*, Xan.).

Fairly common at Okanagan Falls. Taken May 4th, 15th, and June 4th at Schoonover Mountain, elevation 4,000 feet.

*Wright's Flycatcher (*Empidonax wrighti*, Baird.).

Not a common bird at Okanagan Falls on May 5th.

*Magpie (*Pica pica hudsonia*, Sab.).

Common Very abundant from Vaseaux Lake to Osoyoos. Breeds in large colonies at Incameep. Nest is a large structure of sticks usually placed in pine-trees from 15 to 40 feet high, often in willows, etc. Lay from seven to twelve eggs, averaging 1.25 x 0.90. Eggs taken on May 15th at Incameep, one set containing nine and the other seven. Nest is very bulky.

*Black-headed Jay (*Cyanocitta stelleri annectens*, Baird.).

Common throughout the valley. Breeds. Nests and eggs taken on May 2nd at Okanagan Falls. Nest was placed in jack-pine about 25 feet high, near the top. Composed of sticks and lined with wood-fibres, etc.

*Rocky Mountain Jay (*Perisoreus canadensis capitalis*, Ridg.).

Found this fine jay fairly common near the top of Schoonover Mountain at an altitude of from 3,000 to 5,000 feet, in the thick tamarack and spruce belts. The birds are very shy and silent during the nesting season. Several specimens were taken on April 20th and three on June 1st. No birds were seen below 3,000 feet.

*Western Crow (*Corvus brachryhynchos hesperis*, Ridg.).

Very abundant throughout the valley. Nests and eggs taken at Okanagan Falls from April 30th to May 19th. The birds were found breeding in numbers during May along the river-bottoms, from Penticton to Osoyoos. The nests were usually placed from 15 to 30 feet high in alder, poplar, and willow trees. Eggs averaged about five in number, varying from black to greenish white, spotted and blotched with various shades of brown; size, 1.60 x 1.15.

These birds do considerable damage to the smaller birds' nests. On several occasions they were found plundering the homes and destroying the eggs of the goldfinch and western chipping sparrow, which are usually found common in the peach and apple orchards throughout the valley.

*CLARKE'S NUTCRACKER (*Nucifraga columbiana*, Wils.).

The bird found common in the foot-hills from Penticton to Osoyoos Lake, more abundant on the east side. Birds were taken at Penticton (Four-mile Creek) on April 10th, and at Schoonover Mountain, 4,000 feet altitude, on April 20th. Birds have been known to breed in the latter part of February, when the thermometer often registers 20 degrees below zero. From the size of the young birds taken in June, it is without doubt that the birds lay some time about the middle of March. Search for the nests was made daily from April 20th to 25th on Schoonover Mountain, 4,000 feet altitude; only one deserted nest was located in a pine-tree 25 feet from the ground. The nest is a large bulky affair composed of sticks and lined with bark, etc.

*BOBOLINK (*Dolichonyx oryzivorus*, Linn.).

Fairly common. Ten specimens taken at Penticton on June 20th. Located a female building a nest on the ground in the meadow near Penticton on June 18th, and on my return a few days later found the nest deserted. A pair was seen at Okanagan Falls on May 20th.

*COWBIRD (*Molothrus ater ater*, Bodd.)

Birds taken at Penticton on June 25th. Flock of about seven were seen at Okanagan Falls on May 21st. On June 25th a single egg was found in the nest of a Pacific yellow-throat, which contained two eggs, slightly incubated.

*SAN DIEGO REDWING (*Agelaius phœniceus neutralis*, Ridg.).

Very abundant in marshes and swamps throughout the valley. Seen only in the bottom lands. Specimens were taken at Penticton, April 12th; Okanagan Falls, April 15th and May 10th; and Vaseaux Lake and Osoyoos in May. Nests and eggs were taken at Dog Lake on May 21st, also several fine sets at Vaseaux and Osoyoos on May 24th.

*WESTERN MEADOW-LARK (*Sturnella neglecta*, Aud.).

Common at Penticton and Okanagan Falls; abundant nearly everywhere, in the fields and meadows throughout the valley. Breeds.

*BULLOCK'S ORIOLE (*Icterus bullocki*, Swains.).

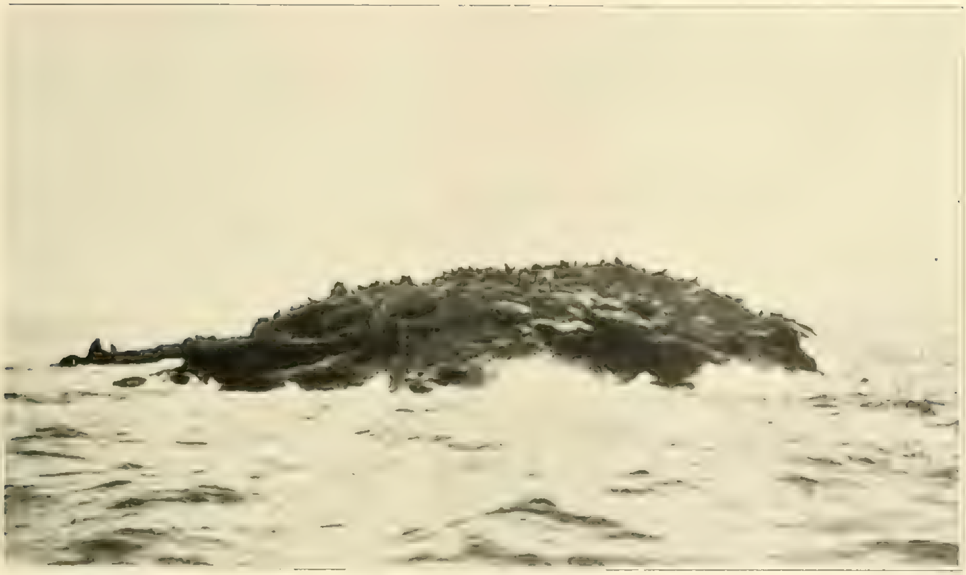
Abundant throughout the valley. Birds taken on May 27th at Penticton, and on June 6th at Vaseaux Lake. Breeds commonly close to water. Nests placed usually in deciduous trees, resembling a hanging basket in shape. Fresh eggs were taken at Penticton on June 15th. Eggs four in number, pale bluish white, streaked and lined with black, brown, and grey; size, 0.95 x 0.60. Nest containing four young was found at Dog Lake on June 20th. The chatter of these birds can be heard from morn till night; and they are very busy during the nesting season.

*BREWER'S BLACKBIRD (*Euphagus cyanocephalus*, Wag.).

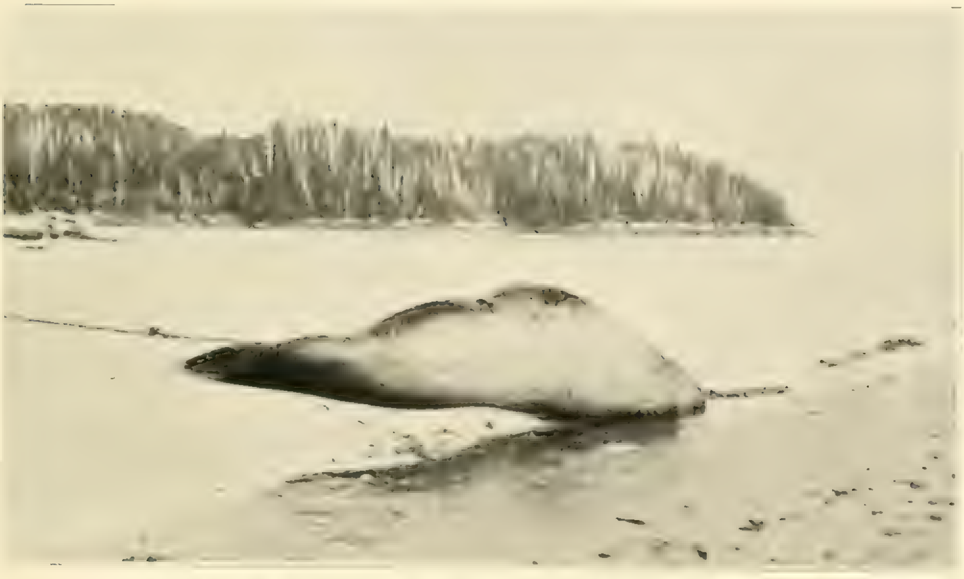
One of the commonest birds in the valley. Large flocks were seen at Penticton on April 12th, and also at Okanagan Falls during the months of May and June. On May 29th a nest containing six eggs was taken. Eggs were slightly incubated. The nest was situated on a haystack in an open meadow—rather an unusual nesting-place. Another fine set was collected at Okanagan Falls on June 15th. Nest was placed on the ground and contained six dull greyish eggs, blotched and spotted with brown and black; size, 1 x 0.75. Incubation fresh.

*WESTERN EVENING GROSBEAK (*Hesperiphona vespertina montana*, Ridg.).

During the first week in June a flock of about twenty birds frequented our camp at Schoonover Mountain (3,500 feet). The birds were watched closely in order to try and locate their nesting-place, but our observations proved in vain. The birds showed no signs of pairing up to June 15th. Several birds were collected on June 12th, and on close examination of the ovaries three females showed no sign of breeding whatever; therefore it is without doubt that these birds lay well on into July. Mr. Blurton mentioned the fact that he once saw a female feeding young birds near Mara during the latter part of July. From observations, it is believed that the birds nest near the tops of tall conifers, 100 to 150 feet high, otherwise an old nest would have been found.



Sea-lions on Pearl Rocks, southwest of Cape Calvert, Queen Charlotte Sound, B.C.



Large Sea-lion killed on Pearl Rocks and towed to [illegible] Bay, [illegible] at [illegible] Island

*Cassin's Purple Finch (*Carpodacus cassini*, Baird).

Common at Okanagan Falls in April and May. A dozen specimens were collected in May at McLean Creek, Okanagan Falls. This bird is one of the finest songsters in the valley during the spring months. Its sweet melodious trills can be heard amongst the trees of the beautiful conifer forests characteristic of the Okanagan.

*Crossbill (*Loxia curvirostra minor*, Brehm).

Two flocks, about forty birds, were seen at Schoonover Mountain (4,000 feet) from June 2nd to 4th. Three males and one female taken on June 2nd.

*Pale Goldfinch (*Astragalinus tristis pallidus*, Mearns).

One male taken at Penticton April 12th; a small flock of seven observed at Okanagan Falls, April 30th; four seen at Penticton, June 14th. Breeds in July.

*Pine Siskin (*Spinus pinus*, Wils.).

Four birds collected at Okanagan Falls, April 12th; one flock of about thirty at Schoonover Mountain, April 20th.

*Snow-bunting (*Plectrophenax nivalis nivalis*, Linn.).

One specimen found dead at Okanagan Falls, May 1st. No other birds seen during the summer.

*Western Savannah Sparrow (*Passerculus sandwichensis alaudinus*, Bon.).

Common throughout the Valley. Taken at Okanagan Falls, April 20th to May 10th.

*Western Lark Sparrow (*Chondestes grammacus strigatus*, Swains.).

Fairly common at Osoyoos, May 16th. Taken at Vaseaux Lake, May 27th. A fine songster.

*Gambel's Sparrow (*Zonotrichia leucophrys gambeli*, Nutt.).

Fairly common. Okanagan Falls, May 6th; Osoyoos, May 22nd.

*Western Chipping-sparrow (*Spizella passerina arizonæ*, Coues).

Common everywhere throughout the valley. Eggs taken, May 30th, June 14th, June 21st and 25th. Nests placed in trees and bushes. Eggs four or five in number, of a greyish blue, spotted and blotched with blackish and purplish markings; size, 0.70 x 0.52.

*Shufeldt's Junco (*Junco hyemalis connectens*, Coues).

Found this bird common on all the foot-hills and higher altitudes throughout the valley. Taken at Penticton, April 10th to 12th; at Okanagan Falls, April 20th and May 10th.

*Rusty Song-sparrow (*Melospiza melodia morphna*, Oberh.).

Common everywhere in the valley. Eggs taken at Vaseaux Lake, May 23rd; at Okanagan Falls, June 11th and 13th. Nests placed in swamp-grass; four or five eggs in number, whitish or greenish white, spotted and blotched with browns of various shades; size, 0.80 x 0.60.

*Spurred Towhee (*Pipilo maculatus montanus*, Swarth).

Abundant throughout the valley. Breeds commonly; nests on the ground. Taken at Okanagan Falls, May 20th; Penticton, June 25th.

*Lazuli Bunting (*Passerina amœna*, Say).

Common in the lower sections of the valley. Birds taken at Vaseaux Lake, May 18th to 27th, June 10th; at Penticton, June 28th. Nests and eggs collected at Vaseaux Lake, May 29th. The nest was placed in small bushes about 4 feet from the ground. The eggs, four in number, were pale bluish white; size, 0.75 x 0.55.

*Western Tanager (*Piranga ludoviciana*, Wils.).

Fairly common at Okanagan Falls. Birds collected at Schoonover Mountain, June 1st; at Okanagan Falls, May 8th.

*Cliff Swallow (*Petrochelidon lunifrons lunifrons*, Say).

Common everywhere in the valley. Breeds commonly in suitable places. Nest constructed of mud, placed on dwellings or cliffs. Eggs four or five in number, whitish, spotted with reddish brown; size, 0.82 x 0.56. Taken at Okanagan Falls, April 30th; Vaseaux Lake, May 16th; Penticton, June 16th.

*Barn-swallow (*Hirundo erythrogastra*, Bod.).

Fairly common at Okanagan Falls and Osoyoos. Nests and eggs taken at Dog Lake, June 19th. Nests in buildings and barns, etc. Eggs four or five in number, slightly paler in markings than the cliff-swallow.

*Tree-swallow (*Iridoprocne bicolor*, Vieill.).

Only a few birds seen at Okanagan Falls on May 10th. Found it the most uncommon of all the swallows. Bird, nest, and eggs taken at Penticton, June 29th. The nest was situated in a hole in a fence-post about 4 feet from the ground. Nest contained three white eggs (hard set); size, 0.75 x 0.50.

*Northern Violet-green Swallow (*Tachycineta thalassina lepida*, Mearns).

Found the bird common everywhere from Penticton to Osoyoos. Breeds commonly in May and June. Vaseaux Lake, May 16th; Penticton, June 26th.

*Bank-Swallow (*Riparia riparia*, Linn.).

Common in suitable breeding-grounds. The bird was found in hundreds breeding in the holes along the banks at Dog Lake on May 16th. Most of the nests contained birds a few days hatched or eggs far advanced. Eggs five or six, whitish in colour; size averaging 0.70 x 0.50.

*Rough-winged Swallow (*Stelgidopteryx serripennis*, Aud.).

Collected several birds at Penticton, June 25th to 30th. A small colony of about forty birds were found breeding in holes in the low bank of the Okanagan River near Penticton. Two sets of eggs were taken, both hard set; nests contained seven whitish-coloured eggs; size, 0.75 x 0.52.

*Cedar Waxwing (*Bombycilla cedrorum*, Vieill.).

Fairly common at Okanagan Falls, Vaseaux Lake, and Penticton in June. Nests and eggs collected at Okanagan Falls, June 20th; eggs measuring 0.85 x 0.60, of a dull greyish blue, blotched and speckled with black and brown markings, mostly towards the larger end.

*Red-eyed Vireo (*Vireosylva olivacea*, Linn.).

The commonest of the vireos found in the valley. Vaseaux Lake, May 22nd; Penticton, June 15th to 25th. Nest and eggs collected at Shuttleworth Creek, Okanagan Falls, June 6th; at Penticton, June 30th. The nests were suspended from the outer branches of deciduous trees, about 6 feet from the ground. Eggs four in number, whitish in colour, sparingly marked with blackish brown; size, 0.85 x 0.55.

*Western Warbling Vireo (*Vireosylva gilva swainsoni*, Baird).

A few were seen at Okanagan Falls, May 7th to 15th. Bird, nest, and eggs were taken at Penticton, June 25th. Building habits similar to the red-eyed vireo. Eggs four in number, white, spotted with dark-brown markings; size, 0.72 x 0.52.

*Cassin's Vireo (*Lanivireo solitarius cassini* Xan.).

Two specimens taken at Okanagan Falls, May 1st.

*Lutescent Warbler (*Vermivora celata lutescens*, Ridg.).

Common at Okanagan Falls and Penticton, May 10th and June 20th. Breeds. Nests on the ground. Eggs four, white, speckled with reddish brown; size, 0.65 x 0.45.

*Alaska Yellow Warbler (*Dendroica æstiva rubiginosa*, Pallas).

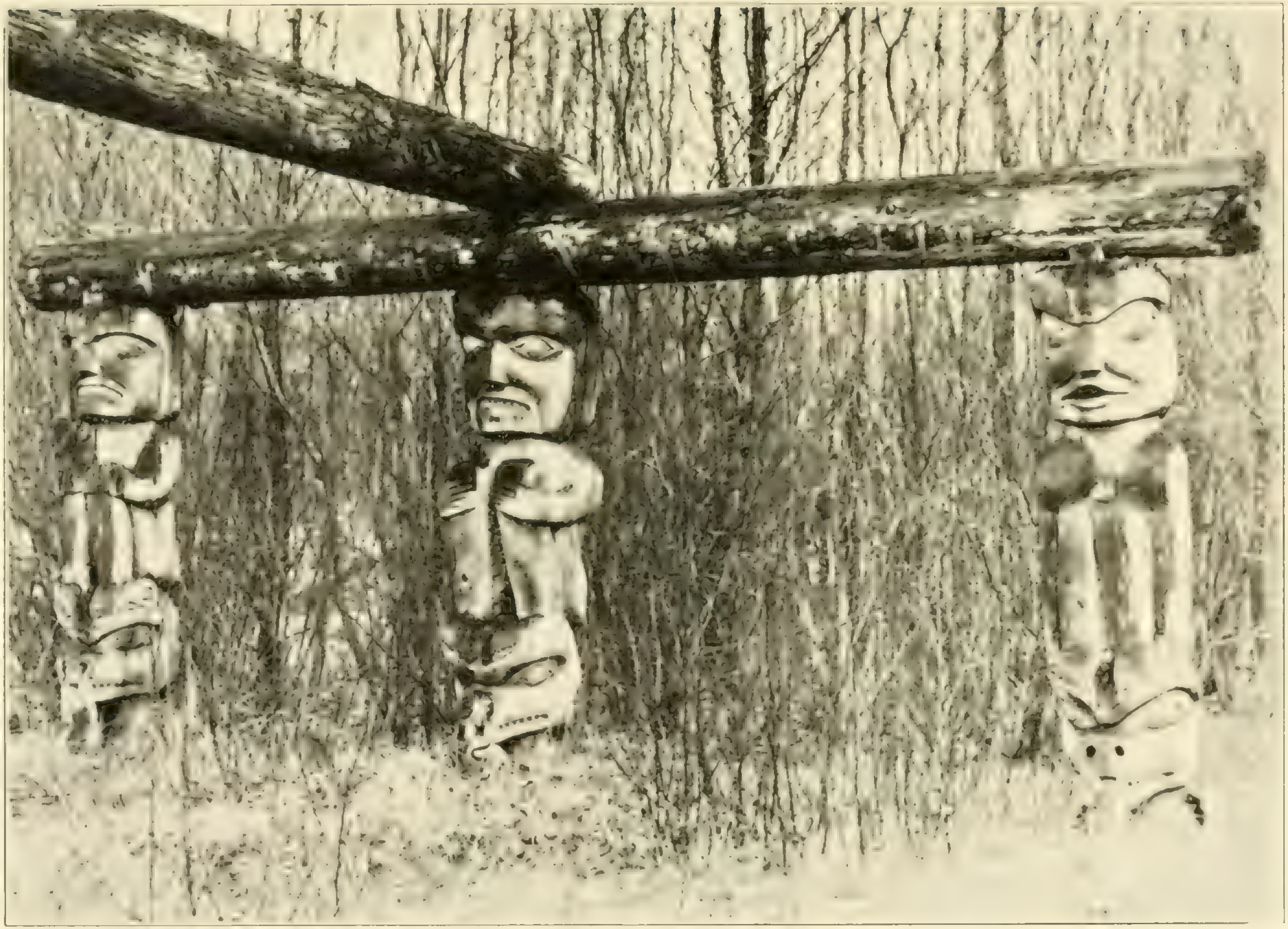
Breeds commonly. Collected at Vaseaux Lake, May 20th; Penticton, June 25th. Quite common at Vaseaux Lake and Dog Lake. Nests and eggs taken at Dog Lake on June 19th in bushes. Eggs four or five in number, of a dull whitish colour, spotted and blotched with various shades of brown and lilac; size, 0.65 x 0.50.

*Audobon's Warbler (*Dendroica auduboni auduboini*, J. K. Towns.).

Common at Okanagan Falls, May 1st to 10th; at Schoonover Mountain, June 1st.

*Macgillivray's Warbler (*Oporornis tolmiei*, J. K. Towns.).

One specimen taken at Schoonover Mountain (Sheep Creek) on June 3rd.



House Totem-poles, Knight Inlet, B.C.

*PACIFIC YELLOW-THROAT (*Geothlypis trichas arizela*, Oberh.).

Common at Vaseaux Lake, May 25th; at Okanagan River (Penticton) in June. One nest collected with two eggs; nest also contained a cowbird's egg. Nest in low bushes about 18 inches from the ground and close to river bank. Eggs whitish, speckled with brown and amber; size, 0.70 x 0.50.

*LONG-TAILED CHAT (*Icteria virens longicauda*, Lawr.).

Fairly common at Penticton and Okanagan Falls. Specimen taken at Penticton, June 24th. Breeds along the river-bottoms.

*GOLDEN PILEOLATED WARBLER (*Wilsonia pusilla chryseola*, Ridg.).

A few seen at intervals at Okanagan Falls and Penticton. Specimen taken at Vaseaux Lake, May 28th and 30th.

*REDSTART (*Setophaga ruticilla*, Linn.).

Only found the bird at Penticton, June 10th to 24th. Nest and eggs collected at Penticton, June 10th. Nest placed in a crotch of bush about 5 feet from the ground. Eggs four in number, slightly incubated, white in colour, spotted with reddish and grey markings; size, 0.65 x 0.50.

*PIPIT (*Anthus rubescens*, Tunstall).

A flock of about 200 seen at Okanagan Falls, May 6th and 7th; specimen taken at Vaseaux Lake, May 7th.

DIPPER (*Cinclus mexicanus unicolor*, Bonap.).

Only two pair were seen, one at McLean Creek, April 25th, and the other at Okanagan Falls. On May 1st a nest was located at Okanagan Falls and shortly afterwards was swept away by the rising water. The bird did not attempt to rebuild in the same locality.

*CATBIRD (*Dumetella carolinensis*, Linn.).

Common from Penticton to Osoyoos. Nests and eggs taken at Penticton, June 15th to 30th. Nests placed in low bushes, containing four or five bluish-green eggs; size, 0.95 x 0.70.

*ROCK-WREN (*Salpinctes obsoletus obsoletus*, Say).

A few birds were seen at Vaseaux Lake, May 18th. By no means common.

WESTERN WINTER WREN (*Nannus hiemalis pacificus*, Baird).

One pair seen at Penticton (Four-mile Creek), April 12th; at Okanagan Falls (Shuttleworth Creek), May 1st to 6th. Not common.

*ROCKY MOUNTAIN NUTHATCH (*Sitta carolinensis nelsoni*, Mearns).

Found this bird common at Shuttleworth Creek, Okanagan Falls, April 25th to 30th.

*RED-BREASTED NUTHATCH (*Sitta canadensis*, Linn.).

Birds collected at McLean Creek, Okanagan Falls, April 28th. Not as common as Rocky Mountain and pygmy nuthatch.

*PYGMY NUTHATCH (*Sitta pygmæa pygmæa*, Vig.).

Common everywhere throughout the valley. Found nests at Vaseaux Lake, May 3rd and 22nd. Nest situated in a hole in a rotten stump about 15 feet from the ground. Eight eggs, whitish, speckled with reddish brown, size, 0.60 x 0.50.

*LONG-TAILED CHICKADEE (*Penthestes atricapillus septentrionalis*, Harris).

Okanagan Falls, May 6th; Vaseaux Lake, June 2nd.

*MOUNTAIN CHICKADEE (*Penthestes gambeli gambeli*, Ridg.).

Okanagan Falls, April 20th to 25th, May 1st to 8th. Fairly common.

*HUDSONIAN CHICKADEE (*Penthestes hudsonicus hudsonicus*, J. R. Forster).

Common at Schoonover Mountain (4,000 feet) in June. Nest and fresh eggs taken, May 31st; five eggs. Nest in hole in tree, eggs white, speckled with reddish brown; size, 0.60 x 0.45.

*RUBY-CROWNED KINGLET (*Regulus calendula calendula*, Linn.).

Common at Okanagan Falls, April, May, and June. Breeds on Schoonover Mountain at an altitude of 4,000 feet. Found old nest in pine-tree about 30 feet high.

*TOWNSEND'S SOLITAIRE (*Myadestes townsendi*, Aud.).

Collected specimens at Okanagan Falls, May 1st; at Schoonover Mountain, June 4th. Occasional birds seen on the higher altitudes.

*AUDUBON'S HERMIT THRUSH (*Hylocichla guttata auduboni*, Baird).

Two birds collected at Schoonover Mountain (3,800 feet), June 5th.

*ROBIN (*Planesticus migratorius migratorius*, Linn.).

Okanagan Falls, May 15th and June 10th. Breeds.

*WESTERN ROBIN (*Planesticus migratorius propinquus*, Ridg.).

Abundant everywhere. Breeds commonly in the valley in May.

*NORTHERN VARIED THRUSH (*Ixoreus nævius meruloides*, Swains.).

Birds collected at Okanagan Falls, April 25th. Few seen at Osoyoos, May 23rd.

*WESTERN BLUEBIRD (*Sialia mexicana occidentalis*, J. K. Towns.).

Common. Penticton, April 10th; Okanagan Falls, April 25th to 30th. Nest and eggs taken at Vaseaux Lake, May 22nd. Eggs six in number, of bluish colour; size, 0.80 x 0.60. A very interesting set of six white eggs collected at Okanagan Falls on June 17th in a hole in a stump.

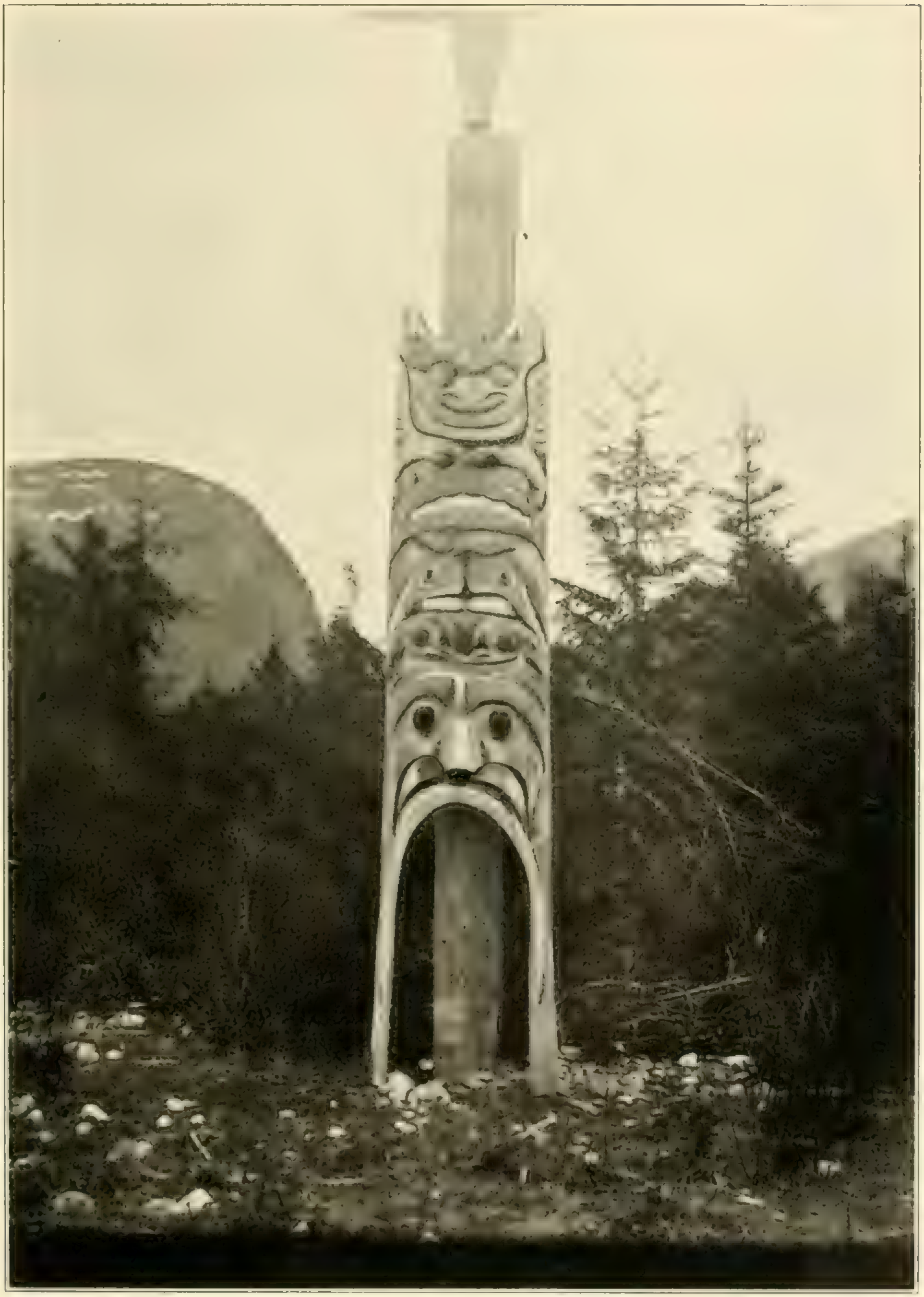
*MOUNTAIN BLUEBIRD (*Sialia currucoides*, Bech.).

Fairly common. Okanagan Falls, April and May; Penticton, June 20th.

LEPIDOPTERA COLLECTED IN THE OKANAGAN VALLEY.

BY E. M. ANDERSON AND C. B. GARRETT.

Papilio daunus. Common, May and June, Vaseaux Lake.
" *eurymedon.* Common, May and June, Vaseaux Lake.
" *rutulus.* A few taken at Vaseaux Lake, May 20th to 30th.
" *turnus.* Vaseaux Lake, Schoonover Mountain, May 15th and June 6th.
" *zolicaon.* Common. Okanagan Falls, May 10th; Schoonover Mountain, June 1st to 6th.
Pontia beckeri. Osoyoos, May 23rd.
" *sisymbri.* Okanagan Falls, April 12th, May 15th. Common.
" *occidentalis.* Okanagan Falls, April 12th, May 15th. Common.
" *rapæ.* Okanagan Falls, April 12th, May 15th. Common.
Synchloe creusa. Okanagan Falls, April 12th, May 15th. Common.
" *ausonides.* Okanagan Falls, April 12th, May 15th. Common.
" *sara.* Okanagan Falls, April 12th, May 15th, and June 6th.
Eurymus eriphyle. Vaseaux Lake, Okanagan Falls, May 20th to June 20th.
" *hatfordii.* Okanagan Falls, May 25th.
" *occidentalis.* Vaseaux Lake, May 18th; Osoyoos, May 25th.
Brenthis freija. Schoonover Mountain, common, June 1st to 6th.
" *bellona.* Schoonover Mountain, common, June 1st to 6th.
" *epithore.* Schoonover Mountain, common, June 1st to 6th.
Lemonias cooperi. Okanagan Falls, Vaseaux Lake, June 1st.
" *palla.* Vaseaux Lake, Jnne 1st to 10th.
" *whitneyii.* Vaseaux Lake, June 1st to 10th.
" *baroni.* Vaseaux Lake, June 12th.
Phycoides pratensis. Okanagan Falls, June 11th.
" *mylitta.* Vaseaux Lake, June 10th.
Eugonia californica. Schoonover Mountain, June 1st.
Euvanessa antiopa. Okanagan Falls, April 15th.
Basilarchia archippus. Vaseaux Lake, May 14th to 30th.
" *lorquini.* Penticton, June 30th.
Cercyonis charon. Vaseaux Lake, June 15th.
Erebia epipsodea. Vaseaux Lake, Schoonover Mountain, June. Common.



Totem-pole — Talio, South Bentinck Arm, B.C.

Cænonympha ampelos. Vaseaux Lake, Schoonover Mountain, May 15th, and June.
Anosia plexippus. Vaseaux Lake, May 15th to 30th.
Uranotes melinus. Okanagan Falls, May 20th.
Callipsyche behrii. Vaseaux Lake, June 16th.
Incasilia iroides. Okanagan Falls.
" *mossi.* Schoonover Mountain, June 1st to 6th.
" *eryphon.* Okanagan Falls, Schoonover Mountain, May 4th and June.
Epidemia zeroe. Vaseaux Lake, June 10th to 15th.
" *helloides.* Vaseaux Lake, common in June.
Cupido heteronea. Schoonover Prairie, June 1st to 6th.
" *fulla.* Okanagan Falls, Schoonover Mountain, common, May 20th, June 6th.
" *sepiolus.* Okanagan Falls, Schoonover Mountain, common, May 20th, June 6th.
Nomiades antiacis. Common everywhere in the valley, May and June.
" *couperii.* Schoonover Mountain, June 1st to 6th.
Phædrotes sagittigera. Schoonover Mountain, June 1st to 6th.
Rusticus melissa. Vaseaux Lake, June 10th to 15th.
" *anna.* Vaseaux Lake, June 10th to 15th.
Cyaniris nigrescens. Common in April and May, Okanagan Falls.
Everes comyntas. Vaseaux Lake, May 20th.
Amblyscirtes vialis. Common in May and June, Okanagan Falls.
Pamphila palæmon. Schoonover Mountain, June 1st to 6th.
Erynnis manitoba. Vaseaux Lake, May 30th, Schoonover Mountain, June 5th.
Thymelicus cernes. Schoonover Mountain, June 3rd.
Thorybes pylades. Okanagan Falls, June.
Pholisora catullus. Okanagan Falls, Schoonover Mountain, June 1st to 6th.
Thanaos icelus. Vaseaux Lake, May 30th.
" *persius.* Okanagan Falls, June 1st.
Hesperia cæspitalis. Okanagan Falls, Schoonover Mountain, May and June. Common.

HERTEROCERA (MOTHS) COLLECTED IN THE OKANAGAN VALLEY, 1913.

By E. M. Anderson and C. B. Garrett.

Lepisesia ulalume. One rubbed specimen, Schoonover Mountain, June 3rd.
Marumba modesta. Penticton, July 5th, one specimen.
Samia columbia. Okanagan Falls, June 10th, one specimen.
Scepsis cockleyi (?). Penticton, June 28th, two taken at light.
Leptarctia californiata. Okanagan Falls, common in April and early part of May.
Isia isabella. Penticton, July 5th.
Apantesis achaia, var. *ornata.* Vaseaux Lake, May 30th to June 10th. Six specimens taken.
Androloma mac-cullochi. Common at Schoonover Mountain, June 1st to 6th.
Hadena cogitata. Penticton, July 3rd.
Xylomiges simplex. Okanagan Falls, common in May; took five in orchard.
" *perlubens.* Okanagan Falls, common in May; took five in orchard.
" *candida* Okanagan Falls, common in May; took five in orchard.
Grapiphora pacifica. Okanagan Falls, common in May; took five in orchard.
Stretchia normalis. Okanagan Falls, May 6th to 8th.
Xylina contenta. Common on blossoms, May 6th.
Cucullia (?). Okanagan Falls, May 1st to 5th, at light.
Rancora solidaginis. Okanagan Falls, May 3rd.
Orthosia crispa (?). Okanagan Falls, May 5th.
Heliothis (?). Vaseaux Lake, May 22nd, one specimen.
Drasteria erechtea. Okanagan Falls, May 5th to 20th.
" *crassiuscula.* Okanagan Falls, May 12th to 20th.
Euclidea cuspidea. Okanagan Falls, May and June. Common.
Nadata gibbosa. Penticton, June 5th, one specimen at light.
Gluphisia septentrionalis. Okanagan Falls, April 28th, one specimen at light.
Euthyatira pudens. Okanagan Falls, May 6th, one specimen at blossoms.

GEOMETRIDÆ (GEOMETERS) COLLECTED IN THE OKANAGAN VALLEY, 1913.

BY E. M. ANDERSON AND C. B. GARRETT.

Tephroclystis (?). Okanagan Falls, May 1st to 10th, at light.
Hydria undulata. Okanagan Falls, April 27th.
Eois sideraria. Schoonover Mountain, June 1st to 6th. Common.
Lycia cognataria. Penticton, July 6th to 8th.
Marmopteryx marmorata. Okanagan Falls, May 4th.
Brephos infans. Okanagan Falls, May 1st.

COLEOPTERA (BEETLES) COLLECTED IN THE OKANAGAN VALLEY, 1913.

BY E. M. ANDERSON AND C. B. GARRETT.

The following is a list of beetles collected in the Okanagan Valley. A miscellaneous collection of over 1,000 still awaits classification :—

Coccinella transversalis.
Comontis ovalis.
Corymbites fallax.
Trogisita chloridea.
Trichodes ornatus.
Didelonycha fulgida.
Saprinus lugens.
Lachnosterna errans.
Cincindella oregona.
" *obliquata.*
Haltica bimarginata.
Chalcophaga angulicollis.
Podabrus comei.
Platynus subsericeus.
Chalæins interuptus.
Creophillus villosus.
Clerus sphegus.
Elodes cordata.
Silpha lapponica.
Necrophorus melschemeri.
Melæ montanus.
Geoderces melanothrix.
Cleonus 4 lineata.
Rhagium lineatuna.
Leptura lætifica.
Ellychnia californica.

MAMMALS COLLECTED IN THE OKANAGAN VALLEY, APRIL, MAY, AND JUNE, 1913.

BY E. M. ANDERSON.

(NOTE.—Species collected on the trip are marked with an asterisk.)

*MULE-DEER (*Cariacus macrotis*, Rich.).

Found it common at Okanagan Falls in nearly all the foot-hills. Male and female killed at Shuttleworth Creek, June 15th.

BIGHORN (MOUNTAIN-SHEEP), (*Ovis canadensis*, Shaw).

Small herd of nine seen in the foot-hills at Shuttleworth Creek in May. Sheep are protected in this district. (No animals shot.)

*FLYING-SQUIRREL (*Sciuropterus volans sabrinus*, Shaw).

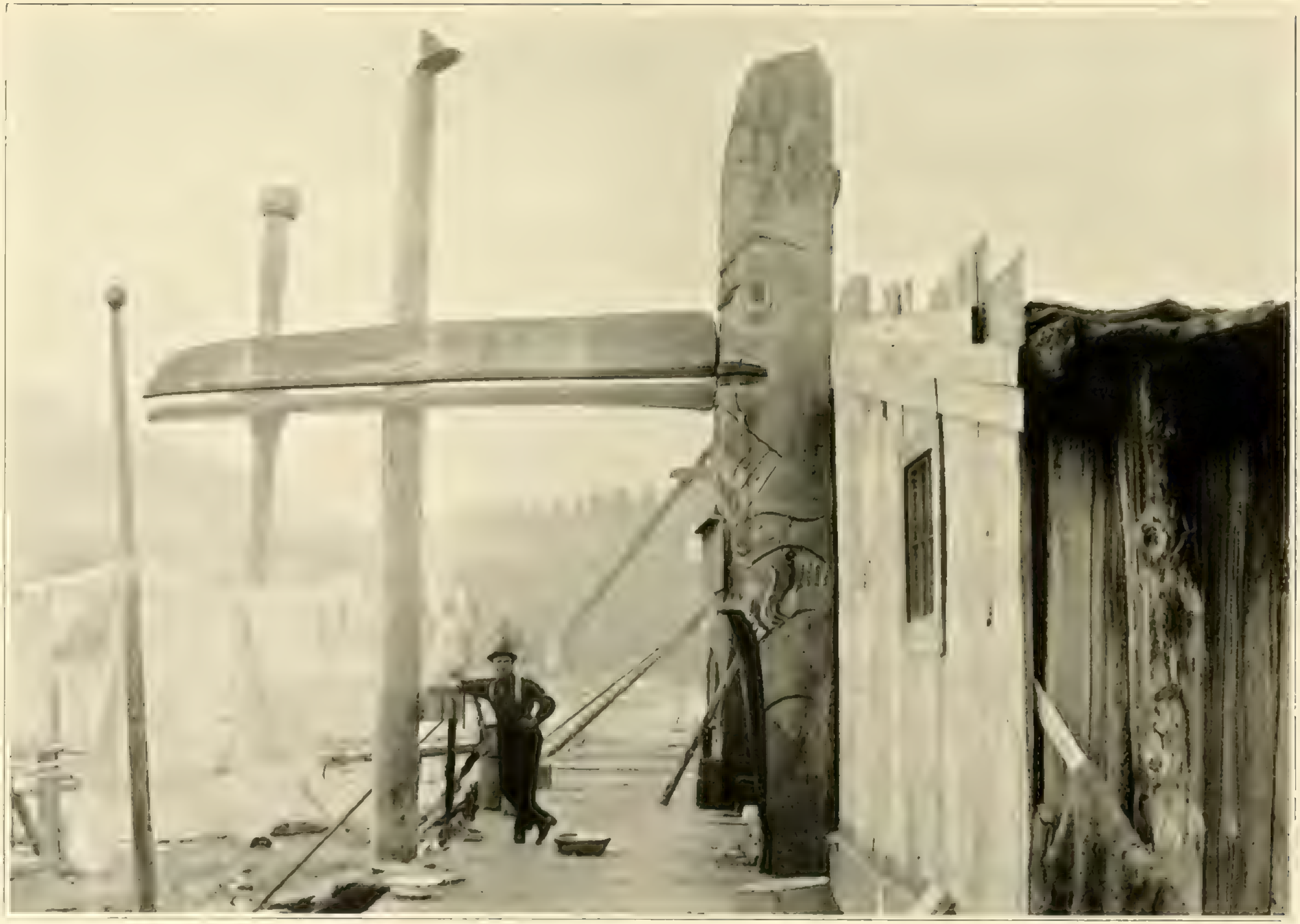
One specimen taken at Shuttleworth Creek, May 10th; three others at Schoonover Mountain, June 1st to 6th.

*SQUIRREL (*Sciurus hudsonius vancouvernesis*, Allen).

Common everywhere in the valley. Specimens taken at Penticton, April 8th; Okanagan Falls, April 15th to June 6th.

*ROCKY MOUNTAIN CHIPMUNK (*Tamias quadrivittatus*, Say.).

Found it common at Okanagan Falls, April 20th, May 20th, and June 1st to 5th.



Totem pole Talio, South Bentinck Arm, B.C.

***Mountain Ground-squirrel** (*Citellus oregonus* Merr.).

Common at Okanagan Falls, May 28th; Schoonover Mountain, June 1st to 6th.

***Yellow-bellied Marmot** (*Marmota flaviventer*, A. & B.).

Specimens taken at Okanagan Falls, April 15th, May 20th, and June 12th. Common.

***Bushy-tailed Wood-rat** (*Neotoma cinerea columbiana*, Elliot).

Okanagan Falls, May 6th; Schoonover Mountain, June 3rd and 4th.

***Pocket-gopher** (*Thomomys douglasi fuscus* Merr.).

Common. Taken at Schoonover Mountain, June 3rd; Penticton, June 26th to 30th.

***North-west Pocket-mouse** (*Perognathus Lordi*, Gray).

Penticton, April 8th; Okanagan Falls, May 11th to 30th; Schoonover Mountain, June 1st to 6th.

***Meadow-vole** (*Microtus ? sp.*).

Two species found. Common at Okanagan Falls, May and June.

***Varying Hare** (*Lepus Americanus washingtoni*, Baird).

Common at Okanagan Falls. Taken April 20th, May 10th and 22nd.

Black Bear (*Ursus americanus*, Pallas).

One seen at Vaseaux Lake, June 7th.

Skunk (*Mephitis occidentalis*, Baird).

One observed in field at Osoyoos Lake, May 23rd.

***Bat** (*Myotis yumanensis saturatus*, Miller).

Taken at Vaseaux Lake, May 15th to 30th, June 14th.

Note.—Twenty-seven bats were taken at Vaseaux Lake. Three species still remain to be identified. Also several rodents await classification.

Reptilia.

***Pacific Terrapin** (*Clemmys marmorata*, B. & G.).

Common on all the lakes. Taken at Vaseaux Lake, June 5th to 15th.

***Blue-tailed Lizard.**

One taken at Dog Lake on road-cut, June 10th.

***Bull-snake (Gopher-snake)**, (*Pituophis catinifer deserticola*, Stej.).

Common everywhere. Okanagan Falls, April 12th, May 6th; Vaseaux Lake, May 26th and June 7th.

***Pacific Rattlesnake** (*Crotalus lucifer.*).

Common at Okanagan Falls and Vaseaux Lake, May 3rd, 20th, 26th, June 5th and 10th.

***Blue Racer.**

Okanagan Falls, May 28th; Vaseaux Lake, May 30th and June 10th. Common; the swiftest of all snakes in the valley.

Note.—Twelve unidentified frogs and toads were taken at Okanagan Falls.

REPORT ON BIRDS COLLECTED AND OBSERVED DURING SEPTEMBER, 1913, ON ATLIN LAKE, FROM ATLIN TO SOUTH END OF THE LAKE.

By F. Kermode and E. M. Anderson.

(Note.—Species collected on the trip are marked with an asterisk.)

***Holbœll's Grebe** (*Colymbus holbœlli*, Reinh.).

Atlin Lake, September 7th to 10th. Common.

***Horned Grebe** (*Colymbus auritus*, Linn.).

Atlin Lake, September 7th. Not as plentiful as Holboell's grebe.

LOON (*Gavia immer*, Brun.).

Seen on Atlin Lake, September 7th, 10th, and 19th.

*MALLARD (*Anas platyrhynchos*, Linn.).

Atlin Lake, September 7th to 20th. Common. Large flock seen at Pike River, September 9th.

*GREEN-WINGED TEAL (*Nettion carolinense*, Gmel.).

One specimen taken in swamp, Atlin Lake, September 10th.

SHOVELLER (*Spatula clypeata*, Linn.).

Four observed on September 11th near Copper Island, Atlin Lake.

*LESSER SCAUP-DUCK (*Marila affinis*, Eyton).

Female shot at Williams Creek, Atlin Lake, September 18th.

*GOLDEN-EYE (*Clangula clangula americana*, Bonap.).

Female taken at Atlin Lake, September 10th.

BLACK-BELLIED PLOVER (*Squatarola squatarola*, Linn.).

Three birds seen on the lake-shore at Atlin, September 28th.

*SOOTY-GROUSE (*Dendragopus obscurus fuliginosus*, Ridg.).

Female shot at Williams Creek, Atlin Lake, September 16th.

*ALASKA SPRUCE-GROUSE (*Canachites canadensis osgoodi*, Bish.).

Common at Atlin. Ten specimens collected, Pike River, Atlin Lake, September 9th to 25th.

*GRAY RUFFED GROUSE (*Bonasa umbellus umbelloides*, Doug.).

One specimen taken near Atlin, September 27th.

*WILLOW-PTARMIGAN (*Lagopus lagopus lagopus*, Linn.).

Specimens taken at Blue Canyon, near Atlin, September 28th.

*ROCK-PTARMIGAN (*Lagopus rupestris rupestris*, Gmel.).

Five birds shot at Blue Canyon, Atlin, September 28th. Both willow and rock ptarmigans were found in the same flock.

*WHITE-TAILED PTARMIGAN (*Lagopus leucurus leucurus*, Swains.).

One specimen at Pine River, Atlin Lake, September 10th.

*MARSH-HAWK (*Circus hudsonius*, Linn.).

One specimen at Pine River, Atlin Lake, September 10th.

BALD EAGLE (*Haliaetus leucocephalus leucocephalus*, Linn.).

One bird observed on wing, Atlin Lake, September 8th.

*DESERT SPARROW-HAWK (*Falco sparverius phalœna*, Less.).

Immature male taken at Pike River, Atlin, September 10th. Three others seen, September 15th and 18th, at Williams Creek, south end of Atlin Lake.

DUSKY HORNED OWL (*Bubo virginianus saturatus*, Ridg.).

One observed in camp at Williams Creek, Atlin, September 14th.

*HAWK-OWL (*Surnia ulula caparoch*, Müller).

Fairly common at south end of Lake Atlin. Specimens taken, September 8th to 16th.

BELTED KINGFISHER (*Ceryle alcyon*, Linn.).

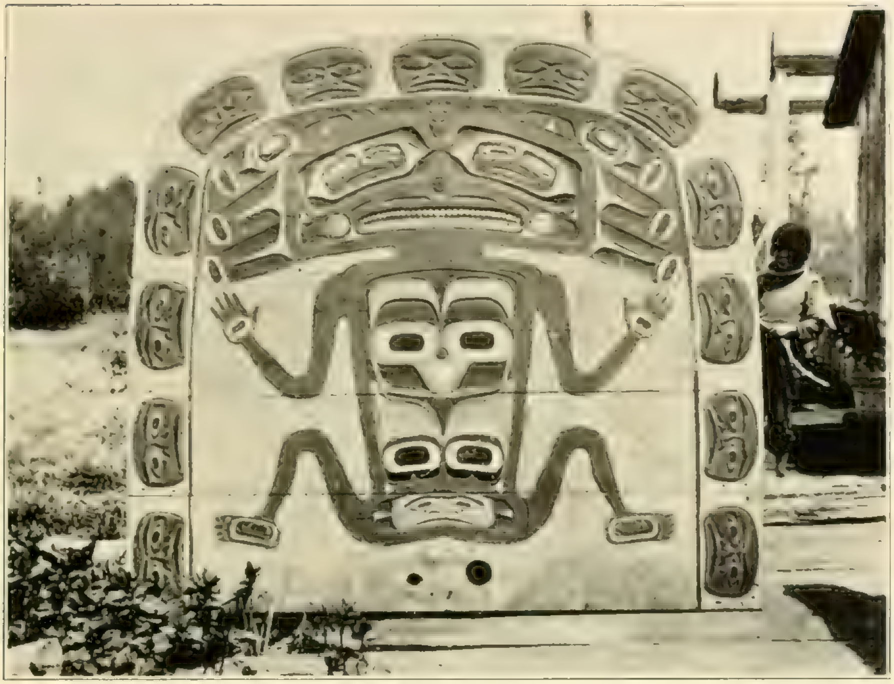
An occasional bird observed at Atlin Lake, September 9th to 20th.

*ALPINE THREE-TOED WOODPECKER (*Picoides americanus dorsalis*, Baird).

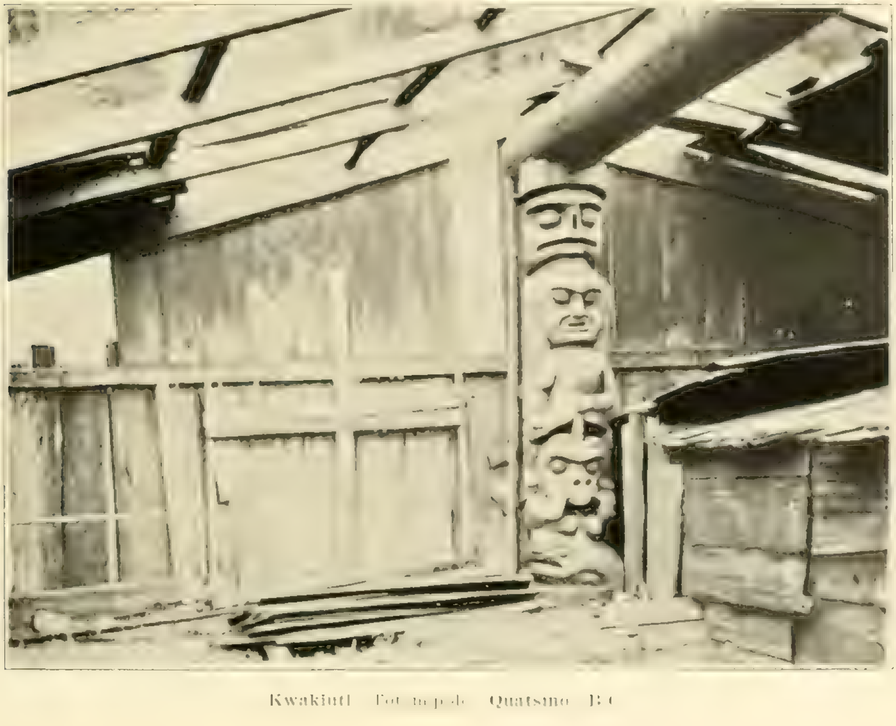
One specimen taken at Williams Creek, September 16th.

*ALASKA JAY (*Perisoreus canadensis fumifrons*, Ridg.).

Common at Atlin. Specimens collected at Pike River, September 7th, 10th, and 15th.



Tsimshian Chief's Crest-board, Nass River, B.C



Kwakiutl Totem-pole, Quatsino, B.C

North-western Crow (*Corvus caurinus*, Baird).

Birds common at Atlin, September 1st to 29th.

Rusty Blackbird (*Euphagus carolinus*, Muller).

One specimen seen near Baker Lake, September 19th. Identity certain.

Hepburn's Rosy Finch (*Leucosticte tephrocotis littoralis*, Baird).

A flock of about fifteen birds seen near summit of mountain, south end of Atlin Lake, near Moose River, September 8th.

Golden-crowned Sparrow (*Zonotrichia coronata*, Pallas).

About a dozen birds were seen at Atlin, September 4th to 12th.

Slate-coloured Junco (*Junco hyemalis hyemalis*, Linn.).

Birds observed at Atlin, September 5th and 8th.

Bohemian Waxwing (*Bombycilla garrula*, Linn.).

Flock of about fifty seen at Pike River, Atlin Lake, September 10th.

Audubon's Warbler (*Dendroica auduboni auduboni*, J. K. Towns.).

Common at the south end of Atlin Lake, September 7th, 8th, and 14th.

Pipit (*Anthus rubescens*, Tunstall).

Common at Pike River, September 10th to 15th.

*Long-tailed Chickadee (*Penthestes atricapillus septentrionalis*, Harris).

Atlin, Williams Creek, September 10th.

*Hudsonian Chickadee (*Penthestes hudsonicus hudsonicus*, J. R. Forster).

Williams Creek, September 18th. Two specimens taken.

Townsend's Solitaire (*Myadestes townsendi*, Aud.).

One bird seen on the mountain-side, Atlin Lake, September 9th.

Robin (*Planesticus migratorius migratorius*, Linn.).

Atlin Lake, September 4th to 28th.

MAMMALS COLLECTED IN THE ATLIN DISTRICT, SEPTEMBER, 1913.

By F. Kermode and E. M. Anderson.

(Note.—Specimens collected on the trip are marked with an asterisk.)

*Mountain-goat (*Oreamnos montanus*, Ord.).

Three were observed from the lake on Cathedral Mountain, Atlin Lake, September 11th. Male and female killed on mountain at Williams Creek, south end of Atlin Lake, September 14th and 15th. Two others seen near the top of a high peak above Baker Lake.

*Red Squirrel (*Sciurus hudsonius*, Erx.).

Three collected at Moose River, Atlin, September 10th to 12th.

*Northern Chipmunk (*Tamias quadrivittatus borealis*, Allen).

One specimen taken at Pike River, Atlin, September 11th.

*Jumpimg-mouse (*Zapus hudsonius*, Zimm.).

Male taken at Moose River, Atlin. September 12th.

*Varying Hare (*Lepus americanus*, Erx.).

Three collected at Pike River, September 10th to 15th. Common.

*Black Bear (*Ursus americanus*, Pallas).

Male killed near Pike River, September 12th. Skin is dark brownish in colour.

*Bat (*Myotis sp.*).

Male and female taken at Moose River, September 11th.

ACCESSIONS, 1913.

Jan. 8. 1 Mallard.
1 Lesser Scaup-duck.
2 American Scaup-duck.
1 Barrow's Golden-eye.
3 American Golden-eye.
4 Buffalo-head.
2 Killdeer Plover.
1 Black turnstone.
4 Hepburn's Leucosticte.
1 Snowflake.
1 Rat.

Collected at Parksville, B.C., by E. M. Anderson.

Jan. 22. 1 Mourning-dove. Presented by H. Dodd, Telegraph Creek, B.C.
″ 25. Rib of a whale. Found on Saturna Island, B.C.; presented by C. A. Lewis.
″ 29. Reeve's Pheasant (male). Presented by Dr. Brown, Nanaimo.
Feb. 3. White-crested Cormorant, Sidney, B.C. Presented by Mrs. Nicholson.
″ 5. Ratfish. Presented by J. Lucas, Victoria.
″ 7. Evening Grosbeaks (male and female), Parksville, B.C. Presented by G. H. Pettierew.
″ 9. Flying squirrels (4), Broadwater, B.C. Presented by A. Campbell.
″ 15. Trumpeter-swan, Qualicum, B.C. Presented by J. Graham.
″ 16. Holbœll's Grebe (male). Picked up on beach and presented by E. G. Kermode.
″ 17. 6 Willow-ptarmigan, Atlin, B.C. Presented by Horace Fraser.
″ 17. 5 White-tailed Ptarmigan, Atlin, B.C. Presented by Horace Fraser.
March 10. Barnacle, Esquimalt, B.C. Presented by F. Saunders.
″ 10. 1 White-tailed Ptarmigan, Nicola, B.C. A. B. Williams.
″ 3 Mountain-goat heads, Bella Coola. Purchased.
″ Mule-deer (whole skin). C. B. Garrett, Cranbrook.
″ 1 White-tailed Deer. C. B. Garrett, Cranbrook.
1 White-tailed deer head. C. B. Garrett, Cranbrook.
″ 17. 1 Sharp-tailed Grouse, Grande Prairie, B.C. F. Kermode.
17. 1 Varying Hare, Grande Prairie, B.C., F. Kermode.
″ 10. Collection of African arrows. H. W. Seaton-Karr.
April 6. Cassin's Purple Finch. Presented by Junior Audubon Society, Nelson.
″ 23. 3 Sooty-grouse, Malahat, V.I. F. Kermode.
″ 25. Crayfish. Found in Colquitz Creek, Victoria, and presented by J. D. Anderson.
May 11. Crab, Victoria. Presented by M. Cancellor.
″ 17. North-west Coast Heron eggs, Saturna Island. F. Kermode.
″ 17. Crow's nest and eggs, Bare Island. F. Kermode.
″ 17. Starfishes, Bare Island. F. Kermode.
″ 19. 2 Indian stone pestles. Presented by J. McKay, Enderby.
″ 3. 2 Moose heads and scalps. Purchased.
4 Stone's Sheep heads and scalps. Purchased.
1 Albino Moose (whole skin), female. Telegraph Creek, B.C.
1 Grizzly Bear, leg-bones and skull, Telegraph Creek, B.C.
″ 24. 2 Black Bear cubs. Purchased at Bella Coola.
June 14. Fossils (Shells, etc.). Presented by Miss Bonavia, Victoria.
″ 25. Sea-lion. Dr. C. F. Newcombe.
″ 25. Sea-lions (2). F. Kermode.
July 5. Land-otter skull, Mink Trap Bay, Pitt Island (caught in a trap). Presented by W. A. Newcombe.
″ 17. Catfish. Collected at Langford Lake. E. M. Anderson.
″ 17. 3 Sunfish. Collected at Langford Lake, E. M. Anderson.
″ 26. Hairworm, Bella Coola. Presented by E. R. A. Russell.
Sept. Skeletons of snake swallowing horned lizard. R. H. Machen.
Oct. 1. Moose-head. Purchased at Atlin.
″ 1. Fannin's Sheep head. Purchased at Atlin.
″ 1. 2 Stone's Sheep head. Purchased at Atlin.
Nov. 1. Osborne's Caribou (male). Purchased at Atlin.
″ 1. Albatross-eggs. Presented by Allan Ouston, Yokohama.
Dec. 4. 2 Black Rats. Presented by Tatham and Dangerfield, Victoria.
″ 15. Indian curios, carved-bone bark-knife, weaving-needle, etc., found in railway-cutting three miles from Ashcroft. Presented by C. Branson.

ANTHROPOLOGY.

REPORT OF C. F. NEWCOMBE, M.D., FOR 1913.

138 Dallas Road,
Victoria, B.C., Dec. 31st, 1913.

F. Kermode, Esq.,
Director, Provincial Museum, Victoria, B.C.

Sir,—I have the honour to report that during the current year I have collected material and data for the anthropological section from the following Indian villages, and from a few private collections.

In the beginning of February I went over to Vancouver to look at a collection of Upper Skeena curios, which I purchased, finding that the specimens would fill up one or two blanks from that locality. On my return to Victoria I acquired another small collection of Nass River material.

In the latter part of February I went to the following Lower Fraser villages: Upper and Lower Sardis, Chilliwack, Chehalis, and Yale. Old material is very scarce in this locality. I purchased two blankets (which were left to be decorated), a long river-canoe, and a number of small articles and foods, and gave orders for models where necessary.

The first week in March was spent in Vancouver and vicinity, getting in touch with the owners of some very interesting specimens. I succeeded in purchasing a collection containing sixty-five specimens from the Yale District, and also a dozen of the rare Chilcotin baskets.

On March 18th I left for the Kwakiutl and Bella Coola Districts. On leaving the boat at Alert Bay, I found the Indians in the middle of a large potlatch and far too occupied to attend to me, so I went on to Hardy Bay and across to Quatsino. Here, among other things, I purchased a fine inside pole, negotiations for which were opened last year.

From Quatsino I went back to Hardy Bay and took a steamer to Bella Coola. Here were secured a set of nets, traps, boxes, strainers, etc., used in the oolachan industry, also a number of masks and ceremonial objects. Then I took a short trip to Talio, South Bentinck Arm, where two totem-poles and two grave-figures were purchased.

On the return trip from Bella Coola the steamer called in at Kimsquit, where I was lucky in getting a small shovel-nose canoe used in river navigation.

I left the steamer at Alert Bay, but, finding it impossible to do anything for a week, paid a hurried visit to Victoria, arriving back in Alert Bay on April 16th, where I chartered a gasolene-boat to run up Knight's Inlet. At Tsawadi, the village at the head of the inlet, I found the three poles with the carved beam, which you had reported to me, too far gone to purchase, but managed to secure one carving, as well as to open negotiations for others, which were photographed. We called at Tlaoitsis on the way back, where a few masks and ceremonial objects were purchased.

On my return to Alert Bay, I managed to uncover one or two specimens of particular interest, the chief of which being the board sail which you now have. This is the first of its kind secured by any museum to my knowledge.

On May 1st I joined the sloop "Nymphe," Captain Spring, which arrived from Victoria two days previously; the object being to gather information and inspect the haunts of sea-lions, as well as to continue my collecting for the Museum.

On the way north we called at Fort Rupert, Nahwitte (where we purchased an inside totem-pole), Namu, Bella Bella, China Hat, and the Tsimshian villages, Kitkatla, Metlakatla, and Fort Simpson. Specimens were secured at many of these places.

I spent the latter part of May on the Nass River, visiting Lakalzap, Gitex, Angidah, Guineha, Ayansh, Kitladamix, and Kincolith, and, although many purchases were made, the Indians would not part with any of their larger carvings except at exorbitant prices. We secured photographs of nearly every totem-pole and many smaller objects.

On June 1st we crossed over to the Queen Charlotte Islands, making our first call at Masset, where a large majority of the Indians were away. On cruising around the north and west coasts of Graham Island we called in at the deserted villages, Ian, Kung, Yats, Kiusta, and Chaatl, securing specimens at one or two places and photographing the totem-poles at all the villages.

After having called at Skidegate, we worked our way south on the east side of Moresby Island, but only stopped at Ninstints and Kaidsu while in southern waters. On crossing back to the Mainland, a landing was not made until upon arriving at Bella Bella for supplies. Continuing south, we called at the fishing camp on Goose Island, afterwards proceeding to Namu, where you joined us; and coming south by steamer to Victoria, after the visit to Pearl Rocks, arriving home on June 28th.

The latter part of July was spent on the north and west coasts of Vancouver Island, studying the habits of the sea-lions. Quatsino, Nootka, and Ucluelet were visited on the way south, but it was not possible to do any anthropological work, as all the Indians were away fishing at that time of the year.

In the middle of September I made a quick trip to Chilliwack and vicinity to pick up material previously ordered, and through the kind aid of Mrs. Hulbert I was able to interest certain Indians of the Lower Fraser in the gathering of desirable specimens during the winter months.

In the early part of October I went north, and at Alert Bay made arrangements for repairing and painting the pole bought at Tsawadi in the spring, and paid for the other four poles for which negotiations had previously been opened.

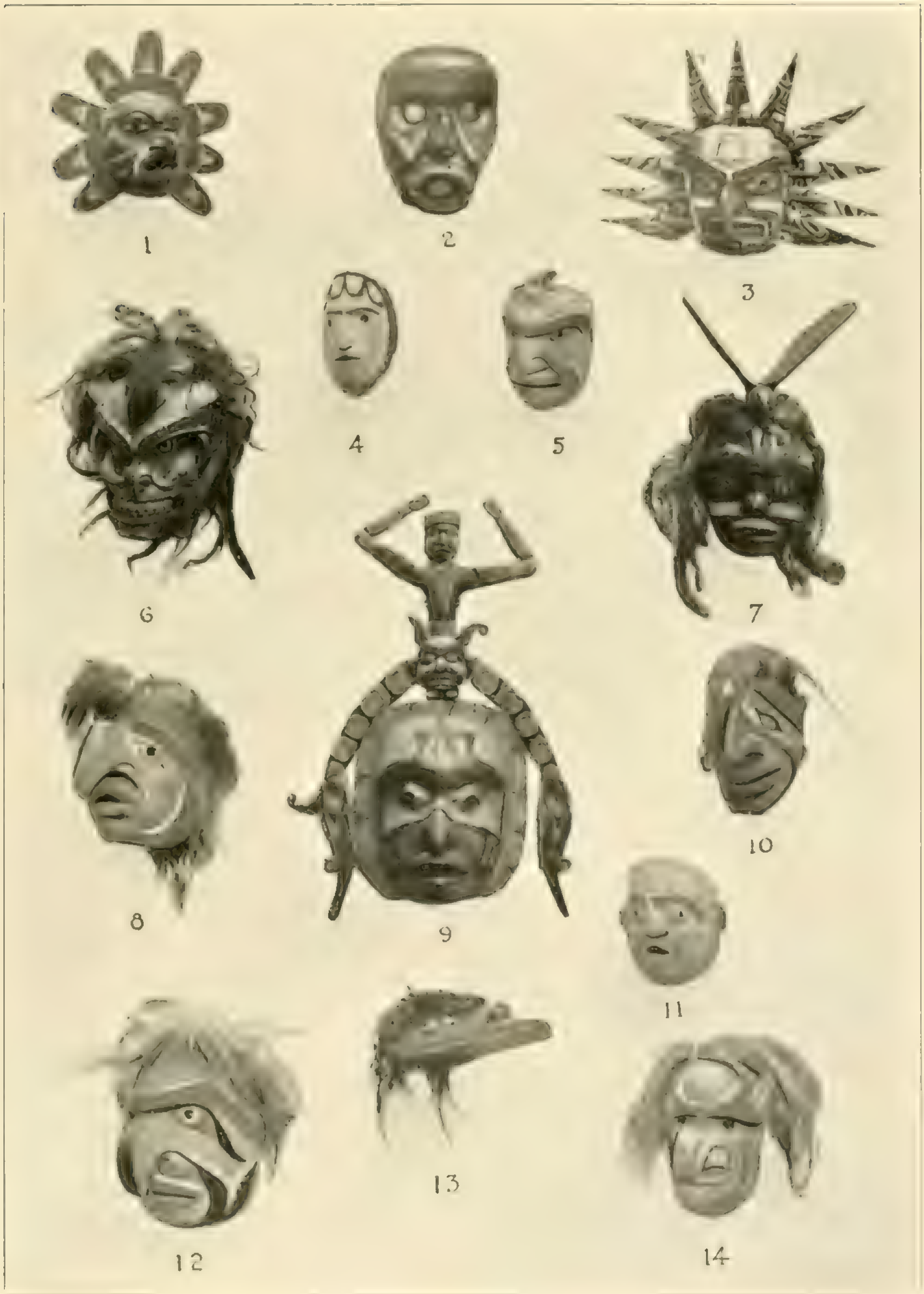
Comox, Courtenay, and Nanaimo were also visited in October, but I could not get the specimens required, as they were in private hands.

I finished the season's collecting with a trip to Alberni, where with Dr. Sapir, Anthropologist of the Geological Survey of Canada, I ordered models of certain implements formerly used by the West Coast Indians.

You already have my annotated list of specimens collected during the year.

I have, etc.,

C. F. NEWCOMBE.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Dance-masks of the Kwakiutl Trib

LIST OF SPECIMENS COLLECTED BY C. F. NEWCOMBE, M.D., 1913.

Tsimshian.

Whistle of bone.
Puberty tube, bone.
Doctor's rattle.
" crown of claws.
" "
" apron with rattles of hoofs.
" spirit-catcher, antler.
" charm of leather.
" " plumed feathers.
" head ornament of eagle quills.
" " "
" leggings of cloth.
" charm, small canoe.
" head-dress.
Dog-eater's head-band.

Dog-eater's collar.
Whistles (4).
Doctor's wig of hair.
Chief's blanket of cloth.
Hat disks.
Toys (2).
Wooden spoons (4).
Horn spoons (2).
Leather bag.
Bag of cedar bark.
Man's cap of skin.
" "
Mat of rabbit-skin.
Mat of squirrel-skins.

Salish.

Vegetable food.
"
"
"
"
Oolachan-net.
Dish.
Spoon.
Paddles (2).
Bailer.
Fish-knife.

Ball of wool.
Stone cut for adze.
Dishes (2).
Adze.
Snow-shoes.
Cradle.
Basket.
Snow-shoes.
Canoe-mat.
Fish-basket.
Chilcotin baskets (12).

Kwakiutl.

Seal dish.
Dsonoqua dish.

Box, inlaid opercula.
" carved.

Haida.

Canoe.
Blankets (2).
Box.
Pipe.
Chisel.
Spear-head.
Soapstone object.
" bait (?).
Carved figures (4).
Stone hammers (3).
Slate fish-knives (5).
Stone war-club.
Whetstone.
Pipes (2).
Chisels (10).
Spear-points (7).
Arrow-points (26).

Stone disk wampum (2).
Copper "
Soapstone pendants (2).
Knives or chisels, small (2).
Knife, broken.
Soapstone objects (2).
Nephrite block.
Stone disk.
Polished agate.
Soapstone object.
Nephrite knife, unfinished.
Rope of cedar twigs.
Mat-creaser.
Spoon.
Awl.
Skin.

Kwakiult.

Slave-killers, Koskimo (2).
Masks (2).
Rigs for small fish (2).
Box with lid.
Berry-dishes (3).
Berry-crusher.
V-shaped box.
Ceremonial tongs (2).
Rattles (2).
Ladles (2).
Dishes (2).
Baton.
Scrapers, claws, and shells (2).
Totem-pole.
Figure.

Bella Coola Salish.

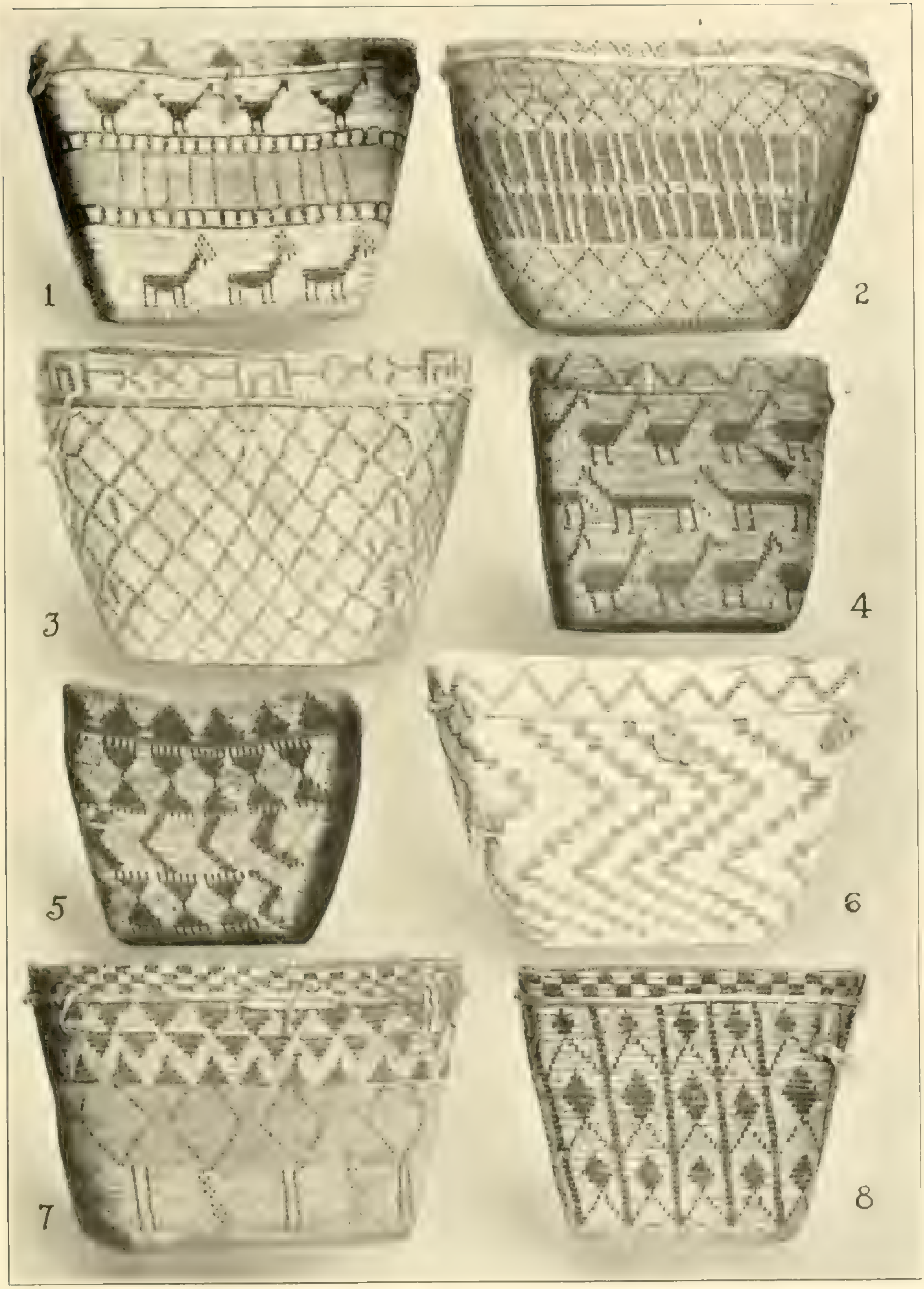
Oolachan-trap.
Digger.
Blanket of fur.
Fish-spear.
Cap.
Oil-box.
Cradle of sticks.
Mortar.
Maul.
Canoe.
Strainer.
Tongs.
Basket for hot stones.
Clover-roots.
Wedges (2).
Oolachan-net.
Salmon-spear.
Dried berries.
Bailer.
Paddle.

Kwakiutl.

Hammer-stones (2).
Berry-frame.
Game-stone.
Hammer for wedges.
Chief's stick.
Blanket of goat's wool.
Totems (2).
Monuments, bear (2).
Mask, sun.
Chief's rattle.
Heligya's rattle.
Mask, sun, of Sisuiltais.
Canoe-box.
    〃 V-shaped.
    〃 square ends.
Baton.
Maul, stone.
Hammer-stone.
Canoe mending cleat (2).
Stone chisel.
Whistle in two pieces.
Board sail.
Whale mask.
Wash-bowl.
Dip-net and sticks (3).
Crushing-stone.
Pile-driver.
Adze.
Masks (9).
Neck-ring.
Blanket of cloth.
Frame, slat.
Bark-chopper.
Sun mask, Sisuitl and man.
Mask, Numasacumlis, butterfly top.
    〃 Gulukwiwi.
    〃 Buquis.
    〃 Nutlmatl.
    〃 Dsonoqua.
Hammer-stone.
Small box.
Chief's stick of yew.
Chief's stick of yellow cedar.
Blanket.
Chief's seat.
Net-sticks (2).
Small chisel.
Canoe.
Stone hammer.

Tsimshian.

Fish-club.
Duitziq.
Figures (2).
Chisel.
Hand-hammer.
Maul.
Mortar.
Spear-point.
Rattle.
Totem-pole.
Ladle.
Wedges (3).
Spoon.
Beaver-tooth in jar.
Spear-shaft.
Stone hammers (3).



Chilcotin Baskets.

Tsimshian.—Concluded.

Dish.
Gambling sticks.
Hammer-stone.
Horn spoon.
Charm-stone.
Doctor's stick.
Horn spoon.
Slate mirror.
Mortuary model.
Pestle.
Needle.
Horn spoon.
Stone hammer.
Needle and string.
Spoon, goat's horn.
Spoons (3).
Bark-stripper.
Stone adze.
Stone hammer.
Carver board.
Spoon.
Mortar, paint, and brush.
Charm-stone.
Painted chest.
Doctor's box.
Wooden figure.
Doctor's "
" bearskin charm.
" "
Stone adze.
Face of amalite.
Tlingit basket.
Skin charms (2).
Pecten rattle.
Amalite.
Sinker.
Stone adze (2).
Skin-scraper.
Frog carving.
Charm-stone.
" bone.
" teeth.
Fasting-stones.
Stone charm.
Wooden spoons (2).
Hammer.
" oblong with rounded ends.
" " squared ends.
Bark blanket.
Fighting-club.
Mask.
Spoons.
Bag of maple.
Arrow-points (2).
Mirror.
Basket of maple bark.
Doctor's weasel charm.
" rattles (2).
" crowns (2).
" apron.
" rattle.
Gambling-sticks.
Charm-bones (3).
Spoon.
Mortars (2).
Spindle whorl.
Grease-skimmer.
Stone pestle
Box.
Face of amalite.
Mortar.
Adze (2).

Haida.

Doctor's blanket.
" beating-sticks.
" box.
Carved board.
Hammer-stone.
Labret.
Slate totem-models (2).
Slate dish.
Sinker.
Oval stone.
Indian tea.

COLLECTION MADE BY J. A. TEIT FROM THE INTERIOR TRIBES OF BRITISH COLUMBIA, 1913.

Interior Salish (Ntlakyapamuk or Thompson River Tribe).

Riding-saddle of wood.
Floor or bed mat of rushes (3).
Bags, woven of rushes and bark (3).
Rain-cloak of bark.
Baby-carrier of dressed skin.
Deer-skin floor or bed mat.
Coiled basketry carrier.
Floor or bed mat of rushes and bark.
Man's head-band, loon-skin.

Athapascan (Chilcotin Tribe).

Rabbit-skin robe.

Interior Salish (Ntlakyapamuk).

Floor or bed mat.
Woman's cloak.
Short leggings, skin.
Head band or cap, bear-cub skin.
Cap of squirrel-skin.
Man's shoulder-sash, marmot-skin.
Boy's cap, squirrel-skin.

NOTE.—All the Ntlak. specimens are from the Nicola Valley, Spences Bridge, divisions of the tribe.

Ntlak. Tribe.

Cap of marmot-skin.
" rabbit-skin.
" goat-skin.
" marmot and coyote skin.
Head-band of bark, etc.
Cap of hoary marmot-skin.
Apron, squirrel-skins.
Vest or poncho, skins.
" deer-skin.
" coyote-skin.
Man's cap of coyote-head skins.
Bag of deer-skin.
" squirrel-skin.
" rabbit-skin.
" coyote-skin.
Resting-stick.
Soap-berry spoon.
Basketry spoon.
" rattle.
Cedar-bark head-band.
Robe of bark.
Cape of bark.
Skirt of bark.
Pair leggings, bark.
Cap of bark.
Three wooden fish-hooks.
Lodge-mat, two goat-skins.
Woman's cap of squirrel-skins.
Trays of alderwood (2).
Poncho, deer-skin.
Large bark bag.
" basketry bag.
" burden basket.
Small "
Baskets (3).
Fancy baskets (5).
Small trunk-shaped basket.
Oblong basket.
Fancy baskets (15).
Basketry tray.
" (4).
Open-work basket.
Birch-bark baskets (6).
Netted carrying-bag.
Mat of bark.
Bag of bark.
" pleated bark.
Rawhide bag.
Bark bag.
Woman's cap of bark (2).
Handle of root-digger.
Man's cap, deer-skin.
Poncho of coyote-skin.
Bag of bark.

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VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1914.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1914.

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

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1915.

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1915.

To His Honour FRANK STILLMAN BARNARD,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Provincial Museum of Natural History for the year 1914.

HENRY ESSON YOUNG,

Provincial Secretary.

Provincial Secretary's Office, January 21st, 1915.

Provincial Museum of Natural History,
Victoria, B.C., January 21st, 1915.

The Honourable H. E. Young, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the report for the year 1914, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,
FRANCIS KERMODE,
Director.

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1914.

Provincial Museum,
Victoria, B.C., December 31st, 1914.

The Honourable H. E. Young, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—Since the last Annual Report considerable research-work has been carried on in the field, but owing to the financial stringency at the beginning of the year it was deemed advisable to effect economy as far as possible in the administration of the Provincial Museum. A cut of $1,000 was made on the annual maintenance for the year 1914, and again, since the outbreak of the European war, another cut of $1,500 was made. While it is a matter of regret, not being able to avail ourselves of opportunities which from time to time occur, considerable field-work has been carried on and a number of specimens have been secured, with valuable and interesting scientific data.

The Director is pleased to be able to report that since the Public Works Department vacated the temporary building in the rear of the Museum, this building has been handed over to this Department. Although it is not a fire-proof building, it is of great use to us for storage of specimens and study series of natural history, also for laboratories; every available space in the Museum being occupied. Immediately on taking over this annex I arranged to have all the valuable anthropological material which was in storage (at Dr. Newcombe's residence) transferred to this building, where it is now temporarily installed, catalogued, numbered, labelled, and arranged according to tribes. All of this material, which has been collected during the past four years, is of great scientific value to the Province, illustrating the chief points in the common life of the Indians and many of their ceremonial usages, and is now accessible to students of anthropology. The large totem-poles, canoes, etc., are stored in the basement of this temporary building. The collection of bird and mammal skins has also been transferred to this annex, where they are available for study to those who wish to consult them.

Dr. C. F. Newcombe was employed by the Department for a short time during the year to continue anthropological research in regard to the Indians along the Coast. Over one hundred specimens were secured. Mr. J. A. Teit, of Spences Bridge, also carried on the work among the Interior Indians, securing sixty-six specimens. Lists of these specimens are appended to the anthropological reports.

Steps have been taken to revise and add to the botanical collection which for many years has been installed in the Museum, many persons having signified their intention to add to this branch of the Department.

During the year the Director found it impossible to do any field-work, but sent afield, in May, Mr. E. M. Anderson and Mr. C. B. Garrett to carry on the work already started last fall in the Atlin District by myself and assistant. They were very successful on their trip, securing a large number of birds, mammals, and other natural-history specimens, with a vast amount of valuable data. A number of new records for the Province were made.

The matter of obtaining Bare Island (known as Indian Reserve No. 9, Saanich Tribe) to be kept as a permanent bird sanctuary for the preservation of bird-life on this Coast has not yet matured. Mr. Duncan C. Scott, Deputy General Superintendent of Indian Affairs at Ottawa, and Mr. W. E. Ditchburn, the local Commissioner of Indian Affairs, have done a great deal in the way of helping us in this matter and have advised arbitration proceedings. Owing to the existing financial stringency it is deemed advisable to let expropriation proceedings drop for the present, but arrangements have been made with the Indian Department whereby the Provincial Government may put a guard on this island during the nesting season, to look after the preservation of bird-life, but this will not interfere in any way with the Indians who wish to go there to gather camas (commonly called wild onion) for food.

During the year the Department was requested by the Minister of Agriculture to supervise a collection of big-game trophies for the Department of Agriculture, to be exhibited by their Exhibition Branch at the Panama Exposition. These have now all been prepared, and the Museum has loaned through Mr. W. E. Scott, Deputy Minister of Agriculture, several mounted mammals. Taking the collection all through, it will make a very creditable showing of the big game of this Province.

The total number of additions to the Museum collections during 1914 are as follows: Birds, 537; eggs and nests, 110; mammals, 171; botanical, 936; entomological, 2,450; fishes, 15; reptilia (including batrachians), 31; crustaceans, 1; shells, 3; fossils, 10; anthropological, 176.

It was very gratifying to note the interest taken by the school-teachers of the Province who attended the Summer School of Industrial Education held in Victoria in their natural-history studies. At the request of Mr. Deane, of the Education Department, the Director arranged with Dr. C. F. Newcombe to give three lectures in the Provincial Museum on Indian designs and arts. The lectures were well attended and the teachers seemed to take great interest. These lectures were illustrated by charts and drawings prepared by Dr. Newcombe. The Director also gave a lecture on the fauna of the Province, illustrated by lantern-slides, in the George Jay School, which was well attended, and I hope proved instructive to those present. The different classes in connection with this school attended the Museum and were conducted over the collections personally.

Under the present system there is no way of accurately recording the attendance of visitors at the Museum. Only a very small proportion of visitors register their names. During the past year the Director inaugurated a new system whereby the guard in the hall of the Museum checks all parcels, umbrellas, etc., carried by visitors, and also requests that they sign the register; but it must not be forgotten that a great number of visitors are unable to sign, being Orientals, or natives of this Province.

It is proposed during the year 1915 to publish a new check-list of the birds of British Columbia, as it is now some eight or nine years since the last check-list was published. A vast amount of valuable data has been accumulated in regard to the distribution of the birds of the Province, a number of species and subspecies new to the Province having been recorded. Numbers of these specimens have been forwarded to Washington for specific identification. The Provincial Museum collection being only a representative collection of the Province of British Columbia, it is impossible to work out the exact subspecies, not having a representative collection of North America. It is also proposed to compile a preliminary check-list of the fishes, also the Lepidoptera of British Columbia.

During 1915 the Director hopes to be able to do a limited amount of work in the study of marine biology, but the Department is handicapped by not having a suitable vessel to undertake a systematic dredging along the Coast. The proposed work will have to be done at low tide with the aid of a small boat.

The Provincial Museum is indebted to Mr. H. C. Henshaw, Mr. E. Nelson, and Mr. H. C. Oberholser, of the Biological Survey, Department of Agriculture, Washington, D.C., for identification of a collection of bird and mammal skins sent them for examination and comparison; also to the following gentlemen who have generously assisted in the identification of various entomological material: Mr. E. H. Blackmore, of Victoria; Mr. L. W. Swett, of Boston, Mass.; Messrs. Barnes and McDunnough, of Decatur, Ill.; Professor Raymond C. Osburn, of Columbia University; Professor H. S. Hine, of Columbia; Dr. L. O. Howard, Messrs. J. C. Crawford and E. A. Schwartz, of the United States National Museum, Washington, D.C.; and Mr. F. Wolley Dod, of Alberta.

Thanks are also due to the following persons for their aid in securing and keeping records of the birds in their migration in this Province: Messrs. J. A. Munro and Allan Brooks, of Okanagan Landing; C. deB. Green, of Masset; Dr. J. E. H. Kelso, of Edgewood, Lower Arrow Lakes; W. R. Carter, of Alberni; A. H. Palmer, Vancouver District; and W. A. Newcombe, in the Lillooet District.

Annexed will be found a complete list of specimens secured during the year.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

REPORT OF E. M. ANDERSON ON ATLIN EXPEDITION, 1914.

Accompanied by an assistant, Mr. C. B. Garrett, we left Victoria on May 29th, via Skagway, Alaska, arriving at Atlin on June 5th. The following day we outfitted, and after a short journey by wagon of about twenty miles, constructed our camp near Wilson Creek at an altitude of 3,000 feet, and situated close to a small lake. Systematic field-work was carried on in various sections of the country until August 19th. During the trip we established five camps—viz., at Wilson Creek, Hot Springs, Pike River, Anderson Bay, and Atlin. We collected diligently from two to three weeks in each respective locality, careful research being made from the level of Atlin Lake to the summit of the snow-capped mountains. Many interesting specimens and valuable data were gathered, while a number of birds, mammals, and insects proved entirely new records for the Province.

The following is a total summary of material collected: Birds, 422; oological specimens, 94; mammals, 153; botanical specimens, 936; entomological, 2,104; fishes, 12; batrachians (frogs), 25.

Before concluding, I beg to tender my thanks to Mr. J. A. Fraser, Government Agent at Atlin, for his kindness in placing the gasolene-launch "Tagish" at my disposal, whereby we were enabled without difficulty to move camp outfit, etc., and explore numerous points and small islands on Atlin Lake. I may also add that the boat greatly facilitated our work, as it was the means whereby we collected some material that otherwise would have escaped our observation, particularly those species of birds which prefer to inhabit the small remote islands during the nesting season. I also wish to thank Messrs. Sydney Smith, D. Holland, T. Marshall, R. Wallace, and Captain McDonald for their valuable assistance, and also a number of residents of Atlin for their information regarding the district and certain species of birds and mammals of northern British Columbia.

Remarks.

Before reporting on the material collected and observed in the Atlin District, I shall endeavour to outline in general, relative to the conditions, etc., with special mention of the main stations at which we collected.

Atlin.

Atlin, the name derived from a "Tahltan" Indian word, meaning "Big Water" (Atlin Lake, so well named), is the chief mining centre in northern British Columbia. The townsite is situated on the east shores of the lake which bears its name. Unfortunately, shortly before our arrival in June, the town was completely devastated by fire, save for the Government Buildings, Royal Hotel, and a few dwellings, including a mill at the southern end of the town. Rebuilding on the burnt area showed great activity, for during our stay in August several substantial frame buildings were nearing completion, including an adequate hotel which will serve to accommodate many residents, and also furnish a resting-place for the tourist travel during the summer season. From reports gathered from private sources, mining on the creeks was carried on to good advantage. In many instances more gold was procured than in many previous years; this fact is attributed to the extensive placer-mining, where hydraulic pressure is operated on several of the creeks in the surrounding mining district. Considerable assessment and development work is also under way on many of the high grade ores; for example, the famous Engineer mine and the Kirkland group on Taku Arm.

Speaking of the weather conditions, we found them most favourable. The beautiful, long, non-oppressive days, with practically no darkness, and occasional showers, all tended to harmonize with the beautiful surroundings.

Farming is conducted on a small scale close to Atlin. Although plenty of land is available, very little is at present under cultivation. From observations, vegetables seem to thrive the best. During the last week of July we visited a small crop of standing grain; this also adds to the possibilities in regard to agriculture in the north. Little or no collecting was done at Atlin until our return from Pike River on August the 9th, where we remained for ten days. Here we dried and packed our collection for shipment, also collecting daily in the outskirts of the town and adding many interesting specimens not encountered within the other sections visited.

ATLIN LAKE.

Atlin Lake, altitude 2,220 feet, is a large body of snow and glacial water, almost one hundred miles in length and averaging about five miles in width. The lake is very deep in spots; in fact, in some places the depth is unknown. The shore-line is indented with many bays, a number of points, and dotted with many islands of various sizes. Teresa Island, locally called "Goat Island," is the largest on the lake. It is, roughly speaking, about sixteen miles long and five miles wide across the centre. The highest snow-peak on this island is 3,480 feet above the lake. Fishing on the lake is very good; Arctic grayling and the char, or Great Lake trout, are very plentiful. Whitefish are also plentiful. Perhaps the most remarkable sight is the "Llewellyn Glacier." This enormous field of ice stretches from the southern end of Atlin Lake to the "Taku Inlet," on the coast, covering an area approximately ninety miles long, many parts of which reach thirty miles in width. I had the pleasure of viewing both bases; the size is beyond apprehension.

PIKE RIVER.

Pike River is about twelve miles long, flowing north-west and emptying into Atlin Lake. We camped at an abandoned telegraph station about half a mile from the mouth and sheltered in a secluded bay. Most of the surrounding country is flat, with a few small lakes, and timbered with willow, poplar, cottonwood, and spruce. Near the mouth of the river grayling are plentiful. Work was carried on here from July 25th to August 8th, three days of which we collected at Anderson Bay, about four miles distant by water from the Telegraph Cabin. The small inland lakes near Moose River revealed some desirable specimens of birds and mammals. The mountains were explored, but produced nothing of importance, save recording two nests of Golden eagles. The Pika Slide was searched, but none were taken. In all probability they were buried under a snowslide which occurred the day previous to our visit.

HOT SPRINGS.

The country is wooded with spruce and pine, and considerable willow and cottonwood in the bottom lands. Several small lakes are to be found close to the base of a range of mountains running north and south. The Hot Springs are located about a third of a mile from Warm Bay, Atlin Lake, where Mr. Joe Housel nas erected a bath-house which is used to good advantage by passers-by. We camped on the shores of Atlin Lake from July 1st to 28th, moving by boat to Pike River.

WILSON CREEK.

A fork of O'Donnell River, about eight miles long. The country on both sides is mountainous, excepting the head, where open willow-brush is found on the higher elevations. Willow ptarmigan are found commonly on the table-lands during the summer, breeding in suitable places, usually near water. We camped at the base of Gopher Dam Mountain, close to a small lake; and collected in the surrounding district from June 7th to July 1st, securing many valuable specimens.

BIRDS COLLECTED AND OBSERVED IN THE ATLIN DISTRICT, 1914.

HOLBŒL'S GREBE (*Colymbus holbœllii*, Reinhardt).

On July 12th a pair with five downy young were observed close to the lake-shore at Warm Bay. Three were seen at Surprise Lake on August 16th. Although we collected at several small lakes, etc., the birds were found scarce during the nesting season. It is a common bird during the month of September on Lake Atlin.

HORNED GREBE (*Colymbus auritus*, Linnæus).

A single bird was seen on a small lake at Atlin on August 15th. It was common at Atlin Lake in September, 1913.

LOON, GREAT NORTHERN DIVER (*Gavia immer*, Brunnich).

A few birds frequented Warm Bay, Atlin Lake, during July. Several were seen near Pike River early in August.

Black-throated Loon (*Gavia arctica*, Linnæus).

Over a dozen seen throughout the summer on Atlin and the smaller lakes. We found it more plentiful than *Gavia immer*. A pair were found breeding at Camp Lake, Wilson Creek, on June 15th. I am inclined to think that some of the birds observed at a distance may have been the yellow-billed loon (*Gavia adamsii*, Gray). However, since none were shot, it is impossible to list it with certainty.

Herring Gull (*Larus argentatus*, Pontopidian).

While en route to Atlin on June 4th a number of birds were seen feeding on small lakes at Log Cabin, Lake Bennett. We found several pairs nesting on a small rocky island at Atlin Lake. Fresh eggs were taken on July 8th. Seven adult birds were shot in order to ascertain the species with certainty. The eggs, two or three in number, measure 2 x 2.75, of an olive-brownish colour, spotted and blotched with various shades of brown. The eggs are indistinguishable from *Larus glauscens*. The nests were all very crude, being composed of little or no grass at all. Two eggs were laid in a slight depression in the bare ground. The nest is by no means as elaborate as the glaucous-winged gull, which breeds commonly on the Pacific Coast.

California Gull (*Larus californicus*, Lawrence).

An adult female was taken at Warm Bay, Atlin Lake. Two others were seen at the same locality three days later. (Idt. Oberholser.)

Short-billed Gull (*Larus brachyrhynchus*, Rich.).

Three adults were collected at Warm Bay, Atlin Lake, on July 11th, and an immature on July 15th at Hot Springs. An adult and young of the year were taken at Pike River on August 8th. It is quite evident that the birds breed in the vicinity, as several adult birds were seen during the month of July. (Idt. Oberholser.)

Bonaparte's Gull (*Larus philadelphia*, Ord.).

A single specimen was shot at Camp Lake, Wilson Creek, on June 10th. On July 3rd two adults were collected on a small lake near Hot Springs; also two downy young were taken on the lake-shore. I should judge from the size of the young that fresh eggs could be taken about June 1st. Two young with first plumage were shot at Pike River on August 6th. On approaching the nest it was amusing to watch the parent birds fly a short distance and alight on a tree-top and utter cries of warning for the young to conceal themselves in the grasses or swim away to safety; usually they fled to the opposite side of the lake, returning only when assured of being well out of the danger zone. This species was seldom seen on Atlin Lake. It preferred the small inland lakes, with grassy shores. Only one nest was found at the edge of the lake. It was situated in a small willow-bush, about 5 feet from the ground, composed of sticks and lined with grasses. It was not found breeding in colonies, as only one or two pairs were nesting on several of the small lakes visited close to Hot Springs. By no means a common breeder in the district we traversed.

Arctic Tern (*Sterna paradisæa*, Brunnich).

Common nearly everywhere throughout the district. Birds were taken at Wilson Creek from June 9th to July 1st. Also a number at Hot Springs and Pike River in July and August. They breed at the mouth of O'Donnel River. Young were hatched early in July. Twenty-one specimens were collected, varying in measurements. (Idt. Oberholser.)

Merganser (*Mergus americanus*, Cassin).

A female with seven downy young were found feeding close to the shore at Pike River on July 27th. All the young were taken; the female escaped badly wounded. No others were seen.

Mallard (*Anas platyrhynchos*, Linnæus).

A single bird was flushed on Summit Lake, Wilson Creek, on June 25th. Female shot at Pike River on July 30th. A young male collected at a swamp near Anderson Bay, Atlin Lake, on August 5th. A pair were found with young on a small lake on the Indian reserve at Atlin. Three adults collected at Atlin on August 12th. Breeds commonly at the north end of Atlin Lake.

American Widgeon (*Mareca americana*, Gmelin).

One specimen found dead at Indian village, Atlin, on June 6th. No others observed. Reported common in the fall by D. Holland.

Green-winged Teal (*Nettion carolinense*, Gmelin).

Two males taken at Atlin on August 10th and 14th. Found a few in company with mallard on August 15th at Atlin.

Pintail (*Dafila acuta*, Linnæus).

Male and female collected at Atlin on August 12th. Found them feeding with mallard in a swamp at Atlin on August 12th. A common bird in August.

Canvas-back (*Marila valisineria*, Wilson).

A single female observed from shore at Warm Bay, Hot Springs, on July 12th. Its identity was unmistakable, as it was seen quite close in company with five white-winged scoters. No others seen throughout the summer.

Barrow's Golden-eye (*Clangula islandica*, Gmelin).

Two pair were seen on Camp Lake, Wilson Creek, where an adult male and female were shot on June 9th. An additional female was collected at Warm Bay, Hot Springs, on July 3rd. Two females were seen on a small lake near Hot Springs on July 5th. Both birds were in company with five downy young, where we observed the duck carrying the young on their backs and swimming well out of range of our gunshot.

White-winged Scoter (*Oidemia deglandi*, Bonaparte).

Very abundant on Atlin Lake during the latter part of July and early August. Two adults were shot at Pike River Bay on July 28th. Several large flocks of about two hundred were seen on Atlin Lake close to Pike River during August. This species outnumbered all the other ducks during the early fall.

Surf Scoter (*Oidemia perpiscillata*, Linnæus).

A female shot in a flock of white-winged scoters at Pike River on July 29th. Several were seen on the lake during August.

Northern Phalarope (*Lobipes lobatus*, Linnæus).

While en route on the train a flock of about thirty were seen at Lake Bennett on August 20th. Although none were collected, it is probable that this is the species referred to.

Least Sandpiper (*Pisobia minutilla*, Vieillot).

On July 27th a small flock of about ten birds were seen at Atlin, of which one was taken. Another specimen was shot at Pike River Bay on July 29th. The latter was in company with semipalmated plover. (Idt. Oberholser.)

Greater Yellow-legs (*Totanus melanoleucus*, Gmelin).

A single bird taken for this species was seen at Camp Lake, Wilson Creek, on June 10th.

Yellow-legs (*Totanus flavipes*, Gmelin).

One specimen collected at Hot Springs on July 3rd. Another killed at Blue Canyon on August 14th. These were the only birds seen.

Spotted Sandpiper (*Actitis macularia*).

Breeds commonly at Atlin Lake. Most all of the small islands visited on the lake were inhabited by a pair or more. Hard-set eggs were taken on Middle Island on July 8th. Both downy young and adults were secured in the same locality on the same date. This was the only sandpiper found breeding. Other species did not appear from the north until about the beginning of August. Owing to our departure on August 19th, many of the waders known to occur missed our observation.

Semipalmated Plover (*Ægialitis semipalmata*, Bonaparte).

Two males collected at the mouth of O'Donnel River on July 5th. A young male with trace of down still adhering to its neck was taken at Pike River on July 30th. Four adults were seen at Pike River on July 27th. Although no nest was found, it certainly breeds in the vicinity.

Fleming's Grouse (*Dendragapus obscurus flemingi*, Taverner).

Found it breeding in the foot-hills of Gopher Dam Mountain, near Wilson Creek, in June. Birds were taken June 14th and 19th. Others were shot at Burdette Creek on July 15th. New record for Provincial Museum. (Idt. Oberholser.)

Alaska Spruce Partridge (*Canachites canadensis osgoodi*, Bishop).

By far the most abundant of all the grouse family. A large series of birds were taken during June, July, and the early part of August. A nest containing seven hard-set eggs was found on June 23rd at Wilson Creek. On June 27th a nest with a single egg containing a chick was found at Camp Lake. Both nests were situated on the ground at the foot of a small spruce tree of about 10 inches in diameter, and composed of pine and spruce needles, and lined scantily with a few breast-feathers of the female bird. The breeding-ground is presumably where the jack-pine and spruce belt meet, at an altitude of from 3,000 to 4,000 feet. The eggs are of a dark cream buffy colour, spotted profusely with light brown; size, 1.25 x 1.75. The flying young were seen on July 8th at the Middle Islands; one specimen secured.

Canada Ruffed Grouse (*Bonasa umbellus togata*, Linnæus).

Two males were collected at Hot Springs on July 16th and 19th. Two females were seen with six flying young on the same dates. We did not find it common, only flushing an occasional bird while travelling through the bottom lands. Most of the residents of Atlin are misinformed regarding the identity of this grouse. I was indeed surprised to learn that very few settlers can distinguish the ruffed grouse (commonly called willow grouse) with certainty. It is quite evident that the female spruce grouse (fool-hen) is mistaken for the above species.

Willow Ptarmigan (*Lagopus lagopus*, Linnaeus).

A fine series in full breeding dress was taken in June at Wilson Creek, from 3,000 to 4,500 feet. Eggs and downy young were collected at O'Donnel Creek, near the summit, on June 26th. On August 15th ten adults and seven flying young were taken at Blue Canyon, near Slate Creek. The birds deposit their eggs early in June, laying from seven to ten eggs, of a buffy brownish colour, marked with dark umber and brownish spots; size, 1.22 x 1.65. This species is the common form of the north and furnishes the inhabitants with food throughout the winter months. I am told that thousands are killed annually quite close to Atlin. A series of skins submitted to Mr. H. C. Oberholser were identified, *Lagopus lagopus albus*.

Rock Ptarmigan (*Lagopus rupestris rupestris*, Gmelin).

We did not find it common. Two males were taken on the top of Gopher Dam Mountain, Wilson Creek, one on June 26th and a second on July 1st. Like the white-tailed ptarmigan (*Lagopus leucurus leucurus*, Swainson), they were found breeding only in the higher altitudes, where hardly any timber exists, save a few stunted trees, and the ground is covered with false heather and frozen snow.

White-tailed Ptarmigan (*Lagopus leucurus leucurus*, Swainson).

One seen on June 15th at Gopher Dam Mountain, Wilson Creek, at an altitude of about 5,000 feet. No others seen. Dan Holland (guide) reports that during the winter months large flocks of the three species congregate on nearly all the creeks close to Atlin. (Idt. Oberholser.)

Goshawk (*Astur atricapillus atricapillus*, Wilson).

Common everywhere throughout the district. Adults, immature, and young were taken at Hot Springs on July 4th to 16th, and Pike River on August 3rd. This hawk is very destructive to the gallinaceous birds of the district. I witnessed one in pursuit of a blue grouse while on the wing, but the grouse fortunately escaped to cover just in time to save its life from destruction. (Idt. Oberholser.)

Alaskan Red-tail (*Buteo borealis alascensis*, Grinnell).

One specimen taken at Blue Canyon on August 15th. Several were seen on the wing in various sections of the country. Not a common bird. New record for Provincial Museum. (Idt. Oberholser.)

SWAINSON'S HAWK (*Buteo swainsoni*, Bonaparte).

A fine melanistic female was shot at Camp Lake, Wilson Creek, on June 19th. The pair were nesting on the opposite side of the lake to our camp. Unfortunately we did not secure the male, as he escaped badly wounded and was never seen again. A pair was observed on the wing at Hot Springs on July 12th.

GOLDEN EAGLE (*Aquila chrysætos*, Linnæus).

A pair was observed in mid-air at Wilson Creek on June 15th. Two nests were found on Pike Mountain on August 15th. The birds with their young were observed soaring high above the nests. Both the nests were accessible, being situated on shelves of a precipitous cliff near the top of a mountain. The eggs were probably deposited about the middle of May.

NORTHERN BALD EAGLE (*Haliæetus leucocephalus alascanus*, Townsend).

Adult male and downy young collected on July 4th close to a small inland lake near Hot Springs. The nest was a large structure of sticks, roots, bark, etc., placed on the top of a green spruce-tree about 45 feet from the ground. The nest contained only one young, two being the usual number of eggs laid. Not a common bird. More golden eagles were seen during our stay.

PIGEON HAWK (*Falco columbarius columbarius*, Linnæus).

A fine adult taken at Atlin on August 13th. One seen at Wilson Creek in June. Scarce throughout the district. (Idt. Oberholser.)

SPARROW HAWK (*Falco sparverius sparverius*, Linnæus).

Fairly common. Several seen along the roadside between Atlin and Wilson Creek in June, where one specimen was taken on June 21st. An adult female was taken at Pike River on August 7th. The bird frequented our camp occasionally, and was at last shot while feeding on grasshoppers. It proved a fine specimen. (Idt. Oberholser.)

OSPREY (*Pandion haliætus carolinensis*, Gmelin).

A pair were found breeding at the mouth of O'Donnel River on June 20th. Captain McDonald reported that a pair were also breeding at Taku. Not a common bird in the Atlin District.

NORTH-WEST HORNED OWL (*Bubo virginianus lagophonus*, Oberholser.)

Very abundant. Three young birds of the year were taken at Hot Springs on July 6th, 15th, and 19th. Over a dozen horned owls were seen at Hot Springs and Pike River, and it is probable they are all the same variety. (Idt. Oberholser.)

HAWK OWL (*Surnia ulula caparoch*, Müller).

Tolerably abundant nearly everywhere. Two adults and three downy young were taken at Wilson Creek on June 14th, A female was also shot at Pike River on July 28th.

WESTERN BELTED KINGFISHER (*Streptoceryle alcyon caurina*, Grinnell).

By no means a common bird. One specimen was observed at Camp Lake, Wilson Creek, on June 7th. A pair frequented our camp at Anderson Bay, Atlin Lake, where they appeared daily from August 5th to 8th.

ALASKA THREE-TOED WOODPECKER (*Picoides americanus fasciatus*, Baird).

Fairly common. Four specimens collected in the burnt area at Wilson Creek from June 9th to 22nd. Two males and a female were taken at Hot Springs on July 10th to 15th.

NORTHERN FLICKER (*Colaptes auratus luteus*, Bangs).

Fairly common. One specimen observed at McKee Creek on June 6th. A single bird was occasionally seen at Wilson Creek from June 6th to 15th. A fine adult male was shot at Burdette Creek on June 21st. On July 25th a nest was found at Hot Springs containing six flying young. The nest was placed in a hole in a stump about 10 feet from the ground. Only one young was captured, the remainder deserting the nest while we climbed the dead tree-trunk. Others were frequently seen and heard at Pike River in August.

NIGHTHAWK (*Chordeiles virginianus virginianus*, Gmelin).

Fairly common. Birds with complete sets of eggs collected at Hot Springs on July 3rd and 7th. Each nest contained two eggs, deposited on the bare ground. In colour the eggs are greyish white, spotted and faintly blotched with vandyke brown and lavender markings; size, 0.85 x 1.15. (Idt. Oberholser.)

RUFOUS HUMMINGBIRD (*Selasphorus rufus*, Gmelin).

Very scarce throughout the district. On July 24th a pair was observed at Atlin. A single bird was seen on the wing moving southward at Pike River on August 6th. I observed the Atlin birds at close range inside the city on one of the main streets, therefore I can vouch for their identification.

SAY'S PHŒBE (*Saynoris saya*, Bonaparte).

Found the bird common. Two were taken at Wilson Creek on June 18th. An adult and young with first plumage were collected at Atlin on August 11th. On July 8th a pair were found feeding young on Middle Island, Atlin Lake. The nest was placed in a crevice of a steep ledge overhanging the water.

OLIVE-SIDED FLYCATCHER (*Nuttallornis borealis*, Swainson).

This species was found in small numbers at Wilson Creek throughout the month of June, where nest and eggs and six birds were obtained. A pair were shot at Hot Springs on July 24th. The birds inhabited the timbered mountain sections, usually at an elevation of about 3,000 feet. The nest was built in a live spruce-tree, saddled and well hidden, about 1 foot from the end of the bough and 15 feet from the ground, composed of small dead spruce-sticks interwoven with dark-brown dried moss, and scantily lined with fine rootlets. The eggs, four in number, were perfectly fresh, of a dull-cream colour, spotted and blotched with various shades of brown and lilac, chiefly on the larger end; averaging 0.62 x 0.80. Both the female and nest were obtained on June 21st at Wilson Creek. The eggs are very rare in collections. In the catalogue of Canadian Birds by John and James Macoun, published in 1909, Mr. W. Raine records the nest collected by him at Long Lake, Manitoba, as resembling a large wood pewee's nest; such is not the case with the British Columbia bird, as its nest is of an entirely different character.

WESTERN WOOD PEWEE (*Myiochanes richardsoni richardsoni*, Swainson).

The commonest flycatcher throughout the district. In June we obtained several specimens at Wilson Creek and three at Hot Springs on July 10th. The following day the nest was visited with a camera, but we found the young birds had flown; however, we photographed the abandoned nest to good advantage. The nest was placed in the crotch of a defoliated almost dead willow-tree, situated about 6 feet from the ground, and was composed of dried grasses, rotten wood, and coated sparingly with very little lichen, the inside lined with cottonwood down. This nest was rather on the small side, measuring 2¾ inches across the top and about 2 inches deep. (Idt. Oberholser.)

YELLOW-BELLIED FLYCATCHER (*Empidonax flaviventris*, Baird).

An adult male was obtained at Pike River, Atlin, on August 3rd. This was the only one seen, and it was shot in the timbered woods in company with *Empidonax hammondi*. New record for Provincial Museum. (Idt. Oberholser.)

ALDER FLYCATCHER (*Empidonax traillii alnorum*, Brewster).

Two adults and one flying young were taken at Atlin on July 24th. Three others were seen in the same locality. (Idt. Oberholser.)

HAMMOND'S FLYCATCHER (*Empidonax hammondi*, Baird).

One specimen collected at Wilson Creek on June 29th, and also one at Pike River on August 3rd. (Idt. Oberholser.)

WRIGHT'S FLYCATCHER (*Empidonax wrightii*, Baird).

On June 21st a male and female were obtained at Wilson Creek. Another taken about the same spot on June 30th.

NOTE.—None of the *Empidonax* were plentiful throughout the districts we travelled. *Empidonax traillii alnorum* (Brewster) seemed to be the prevailing form which was met with more frequently.

PALLID HORNED LARK (*Otocoris alpestris arcticola*, Oberholser).

Twelve birds which were undoubtedly breeding were collected on the summit of Gopher Dam Mountain, Wilson Creek; all were taken between June 24th and 30th, inclusive. Although there is a remarkable variation in the specimens taken, Mr. Oberholser referred them all to his own subspecies.

CANADA JAY (*Perisoreus canadensis*, Linnæus).

Common everywhere. A good series of birds were collected in June at Wilson Creek, and Hot Springs and Pike River in July and August. The young of first plumage were obtained on July 19th at Wilson Creek. (Idt. Oberholser.)

NORTHERN RAVEN (*Corvus corax principalis*, Ridgway).

None were seen or heard during the nesting season. Two birds flew past our camp at Hot Springs on July 20th. They also appeared a day or so afterwards feeding on the lake-shore. We failed to get a shot at them, as they took flight before we were within range of gunshot. Several were seen at Pike River on August 2nd. By the middle of August we noticed them flocking together. It was a common occurrence to see as many as fifty to one hundred raven in a flock, flying high in the air to some distant feeding-ground.

RUSTY BLACKBIRD (*Euphagus carolinus*, Müller).

We did not encounter this species until the 22nd July, when we found it common at a small inland lake about two miles from Hot Springs. A nice series of adults and young were obtained in various phases of plumage. A few old nests were discovered near the edge of the lake. They were situated in small spruce-trees, close to the trunk, from 2 to 5 feet from the ground. Flocks of a dozen or more were observed in the streets of Atlin in August.

ALASKAN PINE GROSBEAK (*Pinocola enucleator alascensis*, Ridgway).

Although we kept a sharp look-out for these birds, we failed to find any. Mr. Dan Holland, our guide, reported on seeing five at the mouth of O'Donnel on July 5th. He failed to get a shot at them, as they flew to the opposite side of the river, which he was unable to cross. He reports them in the winter as a common resident, where large flocks are often seen in Atlin.

PINE SISKIN (*Spinus pinus*, Wilson).

Common in the wooded sections. Occasional flocks were seen in June and July at Wilson Creek and Hot Springs. Adults and young were taken at Pike River on August 2nd.

WESTERN SAVANNA SPARROW (*Passerculus sandwichensis alaudinus*, Bonaparte).

Common throughout the summer. Adults were obtained in June at Wilson Creek. Two pair were breeding at the edge of a small lake near Wilson Creek. Incidentally, when looking for their nests, we stumbled on two of the Western tree sparrow, both of which contained five fresh eggs. Young of first plumage were taken at Pike River and Atlin in August, where they were quite common in the grassy country. (Idt. Oberholser.)

GAMBEL'S SPARROW (*Zonotrichia leucophrys gambeli*, Nuttal).

Tolerably common. We found it breeding at Wilson Creek in June. Two nests were found, one on June 10th and another on June 12th, at Camp Lake. Both nests contained five fresh eggs of a dull-greenish white and finely spotted with various shades of brown, one set almost obscuring the ground colour; average size, 0.65 x 0.90. Young of first plumage were taken at Pike River in early August.

GOLDEN-CROWNED SPARROW (*Zonotrichia coronata*, Pallas).

We found it very scarce. An adult male was taken at Wilson Creek on June 30th and a female at Hot Springs on July 2nd. Another was seen at Burdette Creek, but we failed to get a shot at it.

WESTERN TREE SPARROW (*Spizella monticola ochracea*, Brewster).

Very abundant in the mountain sections, more frequently met with about willow-swamps from 3,000 to 4,500 feet. We secured a number of fine specimens at Wilson Creek in June. Two sets of eggs were collected at Camp Lake, Wilson Creek, on June 11th. The birds nested in a stunted willow-swamp at the margin of a small lake. Both nests were well concealed in a clump of willow-brush, situated about a foot above the ground, composed of grass fibre and dried grasses interwoven with a little moss, and snugly lined with ptarmigan-feathers. Each nest contained five fresh eggs af a bluish-green colour, spotted and blotched with shades of reddish brown, averaging 0.56 x 0.75 in size. (Idt. Oberholser.)

WESTERN CHIPPING SPARROW (*Spizella arizonae socialis*, Coues).

Abundant everywhere throughout the district. A nest just about ready for depositing eggs was found on the day of our arrival in Atlin on June 6th. Adults were taken at Wilson Creek in June. In August it was common at Pike River, where both adults and young of the first plumage were obtained. (Idt. Oberholser.)

SLATE-COLOURED JUNCO (*Junco hyemalis hyemalis*, Linnæus).

Very common throughout the summer. A large series of adults and young were secured in the different sections of the country visited. Five sets of eggs were taken in June and early July at Wilson Creek and Hot Springs. The eggs, four or five in number, vary considerably in size, markings, and colour. Four sets were pale greenish and one almost cream colour, spotted finely with various shades of brown, averaging in size 0.55 x 0.75. (Idt. Oberholser.)

LINCOLN'S SPARROW (*Melospiza lincolnii*, Audubon).

Apparently not common. Male and female were obtained at Hot Springs on July 3rd. They were shot in a swamp where they were undoubtedly breeding. An adult male was collected in Atlin on August 14th, being shot in a marsh, associated with Western Savanna sparrows. (Idt. Oberholser.)

CLIFF SWALLOW (*Pterochelidon lunifrons lunifrons*, Say).

Abundant summer resident. Large numbers were found building in the town of Atlin. Fresh eggs were taken on June 6th. Adults and young were obtained in Atlin on August 8th.

BARN SWALLOW (*Hirundo erythrogaster erythrogaster*, Boddært).

Common at Pike River and Atlin. Several were found in barns in Atlin and left undisturbed. A pair were nesting in a small flat car which is used for conveying passengers over a portage from Taku to Atlin Lake, a distance of about two miles. The birds fly unconcerned to and fro from the nest while the train is en route. Mr. Sullivan, the engineer of the train, informed me that the birds nest in the same spot yearly, where they raise their young unmolested under such novel conditions. A set of five fresh eggs were obtained at Atlin on June 6th. A nest was found at Pike River on August 2nd with five young. The young were ready to fly on August 8th. (Idt. Oberholser.)

NORTHERN VIOLET-GREEN SWALLOW (*Tachycineta thalassina lepida*, Mearns).

An abundant summer resident. Adults and young taken at Atlin on June 24th. During August a number of the three species were starting to move southward. They were first noticed at Pike River on August 7th. (Idt. Oberholser.)

BOHEMIAN WAXWING (*Bombycilla garulla*, Linnæus).

A common resident. Very abundant at Hot Springs and Atlin. Adults were collected in July at Hot Springs and Middle Islands. We were successful in obtaining four sets of eggs on July 8th on a small island in Lake Atlin. The nests were placed in small spruce-trees, situated from 10 to 15 feet from the ground. The structure is rather a bulky affair, composed of dry pine and spruce sticks, interwoven with dried grasses, cottonwood down, intermingled with a little fur of the varying hare. Two nests contained five eggs, one four, and the other two, all of which were strictly fresh. The average measured 0.100 x 0.75, of a bluish-grey colour, spotted with black, and streaked finely with faint purplish markings. Although the eggs closely resemble the cedar waxwing's, the nests are quite distinguishable from each other, both in size and structure.

ROCKY MOUNTAIN ORANGE-CROWNED WARBLER (*Vermivora celata orestera*, Oberholser).

Only one seen and shot at Pike River on August 2nd, which proved to be a worn male. (Idt. Oberholser.)

Alaska Yellow Warbler (*Dendroica æstiva rubiginosa*, Pallas).

A common summer resident. A pair were found breeding at Wilson Creek on June 15th. Adults and young were taken at Atlin on July 23rd. On June 6th three nests were found under construction in small thick willows about 5 feet high, and located in the centre of the bushes. The nests were larger and more elaborate than the California yellow warbler's procured in the Okanagan in the summer of 1913. We observed more birds in the city limits of Atlin than any other section of the country. They seemed to prefer the more settled districts in preference to the wilderness. (Idt. Oberholser.)

Pipit (*Anthus rubescens*, Turnstall).

About a dozen were observed on a grassy plateau at the summit of Gopher Dam Mountain, Wilson Creek, where two birds were obtained on June 26th and one on June 29th. The birds taken were in fine breeding plumage. It was common in September at Atlin the year previous; large flocks were observed daily migrating south.

Dipper (*Cinclus mexicanus unicolor*, Bonaparte).

It was not until August 17th that a single bird was observed at Spruce Creek Falls. No others were seen, although it is said to occur on most of the creeks, but I failed to procure any.

Long-tailed Chickadee (*Penthestes atricipillus septentrionalis*, Harris).

Fairly common at Pike River in August. Birds were collected at Wilson Creek in June and at Pike River in August. (Idt. Oberholser.)

Columbian Chickadee (*Penthestes hudsonicus columbianus*, Rhoads).

Abundant everywhere. A series of adults and juveniles were obtained throughout the summer. Common at Pike River in August, where they were found in flocks. (Idt. Oberholser.)

Sitka Kinglet (*Regulus calendula grinnelli*, Palmer).

Rather uncommon. A few pair were observed at Wilson Creek in June. Four specimens were obtained near Camp Lake in June. Two adults and one young of the year were collected at Pike River on August 3rd. All these skins were submitted to Mr. Oberholser, who classed them all under this subspecies.

Black-poll Warbler (*Dendroica striata*, Forster).

Twelve specimens were obtained, comprising six males, three females, and three young of the year. Three were taken at Wilson Creek on June 19th to 30th; three on Middle Islands, Lake Atlin, on July 8th; two at Hot Springs on July 17th and 19th; and four at Pike River on July 29th and August 2nd. About twenty birds were observed during the summer. In August it was noticed with *Dendroica coronata hooveri*, moving in a southerly direction. New record for Provincial Museum. (Idt. Oberholser.)

Pileolated Warbler (*Wilsonia pusilla pileolata*, Pallas).

Abundant summer resident. It preferred breeding in the mountainous sections of the country at an elevation of about 3,000 feet. It was common at Wilson Creek in June, where a few were obtained. Birds were collected at Hot Springs in July and at Pike River in August. A nestling was taken at Hot Springs on July 16th. In comparing the skins with specimens from the Coast, I find they are much brighter in colour, the orange being more pronounced. (Idt. Oberholser.)

Townsend's Solitaire (*Myadestes townsendi*, Audubon).

Not common. A male and female were collected at Wilson Creek on June 20th, also a mottled, flying young at Hot Springs on July 19th. A pair were found breeding at Wilson Creek on July 17th. The female was shot, also the nest and eggs taken. The nest was situated in a hole on the side of a low clay bank of a road-cut, and was constructed loosely with small sticks, rootlets, bark strippings, a few dead leaves, and lined with dried grasses. The eggs, three in number, were perfectly fresh, of a dull whitish colour, finely spotted and marked with shades of reddish brown and a little lavander; size, 0.73 x 00.92.

Gray-cheeked Thrush (*Hylocichla aliciæ aliciæ*, Baird).

An adult male was taken at Wilson Creek on June 13th. At Pike River on August 3rd I shot a large thrush in the thick bushes, but although a careful search was made I failed to find it. It was undoubtedly this species. No others were observed. New record for Provincial Museum. (Idt. Oberholser.)

Olive-backed Thrush (*Hylocichla ustulata swainsonii*, Cabanis).

At Hot Springs on July 13th I flushed a female from the nest, and immediately shot it. The nest was placed in a spruce-tree, close to the tree-trunk, about 4 feet from the ground, and composed of rootlets, moss grasses, a few leaves, and lined with dried grasses interwoven with moose-hair. The eggs, three in number, were fresh, of a bluish-green colour, spotted and blotched with lilac-brown markings, mostly at the larger end; size, 0.70 x 0.90. An occasional bird was heard towards evening in the dark woods during July close to Hot Springs. (Idt. Oberholser.)

Sierra Hermit Thrush (*Hylocichla guttata sequoiensis*, Belding).

An adult male was taken at Wilson Creek on June 13th. One female was shot at the same locality on June 28th. All the thrush were found scarce in the district we collected in. (Idt. Oberholser.)

Western Robin (*Planesticus migratorius caurinus*, Grinnell).

Fairly common. Birds, nest, and eggs were taken on June 6th at Atlin. Four nestlings were found at Hot Springs on July 17th; only one was taken. Several nests were found in June and left undisturbed.

Mountain Bluebird (*Sialia carrucoides*, Bechstein).

Common at Atlin and O'Donnel Creek, where a few pair bred. Four adults were collected at Wilson Creek, two males on June 17th and a male and a female on June 30th. Two nests were found at Atlin in June in buildings, containing eggs, none of which were taken, as they were hard-set.

SUPPLEMENT TO THE BIRDS PUBLISHED IN THE ANNUAL REPORT, 1913.

Errata.

Page 10. Belted Kingfisher (*Ceryle alcyon*, Linnæus), read Western Belted Kingfisher (*Steptoceryle alcyon caurina*, Grinnell.)

Page 10. Northern Hairy Woodpecker (*Dryobates villosus leucomelas*, Bodd.). Mr. H. E. Oberholser examined five skins which he labelled Rocky Mountain Hairy Woodpecker (*Dryobates villosus monticola*, Anthony). *Dryobates villosus hyloscopus*, Cab. & Heine; none were taken, all are *monticola*.

Page 11. Traill's Flycatcher (*Empidonax trailli trailli*, Audubon), read Alder Flycatcher (*Empidonax trailli alnorum*, Brewster).

Page 12. Cowbird (*Molothrus ater ater*, Bodd.), read *Molothrus ater artemisiæ*. (Idt. Oberholser.)

Page 12. Western Evening Grosbeak (*Hesperiphona verpertina montana*, Ridg.), read Evening Grosbeak (*Hesperiphona vespertina vespertina*, W. Copp). (Idt. Oberholser.)

Page 14. Alaska Yellow Warbler (*Dendroica æstiva rubiginosa*, Ridgway), read California Yellow Warbler (*Dendroica æstiva brewsteri*). (Idt. Oberholser.)

Page 14. Lutescent Warbler (*Vermivora celata lutescens*, Ridgway), read Rocky Mountain Orange-crowned Warbler (*Vermivora celata orestera*, Ober.). (Idt. Oberholser.)

Page 15. Rocky Mountain Nuthatch (*Sitta carolinensis nelsoni*, Mearns), read Slender-billed Nuthatch (*Sitta carolinensis aculeata*). (Idt. Oberholser.)

Page 15. Hudsonian Chickadee (*Penthestes hudsonicus hudsonicus*, J. R. Forster). The data applies to *Penthestes gambeli gambeli*, Ridgway.

Page 15. Ruby-crowned Kinglet (*Regalus calendula calendula*, Linnæus), read Sitka Kinglet (*Regalus calendula grinnelli*, Ridgway). (Idt. Oberholser.)

Page 16. Audubon's Hermit Thrush (*Hylocichla guttata auduboni*, Baird), read *Hylocichla ustulata swainsoni* Cabanis.

Page 16. Robin (*Planesticus migratorius migratorius*, Linnæus). All birds taken were *Planesticus migratorius caurina*, Grinnell. (Idt. Oberholser.)

Page 16. Northern Varied Thrush (*Ixoreus nævius meruloides*, Swainson). All the birds taken were *Ixoreus nævius*, Gmelin.

Page 20. Sooty Grouse (*Dendragapus obscurus fuliginosa*, Ridgway), read *Dendragapus obscurus flemingi*, Taverna. (Idt. Oberholser.)

Page 20. Gray Ruffed Grouse (*Bonasa umbellus umbelloides*, Dougl.), read Canada Ruffed Grouse (*Bonasa umbellus togata*, Linnæus). (Idt. Oberholser.)

Page 20. Desert Sparrow Hawk (*Falco sparverius phalæna*, Less.), read Sparrow Hawk (*Falco sparverius*, Linnæus). (Idt. Oberholser.)

Page 20. Belted Kingfisher (*Ceryle alcyon*, Linnæus), read Western Belted Kingfisher (*Steptoceryle alcyon caurina*, Grinnell).

Page 20. Alpine Three-toed Woodpecker (*Picoides americanus dorsalis*, Baird), read Alaska Three-toed Woodpecker (*Picoides americanus fasciatus*, Baird). (Idt. Oberholser.)

Page 20. Alaska Jay (*Perisoreus canadensis fumifrons*, Ridgway), read Canada Jay (*Perisoreus canadensis canadensis*, Linnæus). (Idt. Oberholser.)

Page 21. North-west Crow (*Corvus caurinus*, Baird), read Northern Raven (*Corvus corax principalis*, Ridgway). A flock of ravens were mistaken for crows at long range. No crows occur in Atlin.

Page 21. Audubon's Warbler (*Dendroica auduboni auduboni*, Townsend), read Alaska Myrtle Warbler (*Dendroica coronata hooveri*, McGregor).

Page 21. Hudsonian Chickadee (*Penthestes hudsonicus hudsonicus*, J. H. Foster), read Columbia Chickadee (*Penthestes Hudsonicus columbianus*, Rhoads). (Idt. Oberholser.)

...... Interior Marsh Wren (*Cistothorus palustris plesius*, Oberholser). This subspecies should be added to the Okanagan list of birds. We found it common at Vaseaux Lake on May 25th. (Idt. Oberholser.)

MAMMALS COLLECTED IN ATLIN DISTRICT, 1914.

By E. M. Anderson.

(Identified by the Biological Survey of Washington, D.C.)

Hudson Bay Chicaree, Squirrel (*Sciurus hudsonicus hudsonicus*, Erxleben).

Common everywhere in suitable places. Specimens taken in June and July at the various points collected at. Twenty-eight preserved.

Grey-headed Chipmunk (*Eutamias caniceps*, Osgood).

Eighteen specimens were secured. It was not found commonly in the district. Both adults and young were taken at Wilson Creek in June, at Hot Springs in July, and at Pike River in August. Seventeen preserved.

Osgood's Spermophile (*Citellus plesius*, Osgood).

Abundant at Wilson Creek and Surprise Lake. Taken on June 9th to 30th. Fourteen preserved.

HOARY MARMOT, WOODCHUCK (*Marmota caligata*, Eschsch.).

A female was collected at Gopher Dam Mountain, Wilson Creek, on July 29th. It is fairly common at Eldorado, near the summit.

YUKON MARMOT (*Marmota monax ochracea*, Swarth.).

A fine specimen taken at Pike River on July 29th, also a female melanistic form was trapped in the same locality on July 29th. No others were seen. Two specimens preserved.

ARCTIC DEER MOUSE (*Peromyscus maniculatus borealis*, Mearns).

Common. Taken in June, July, and August at Wilson Creek, Hot Springs, and Pike River. Twenty-seven specimens preserved.

ROCK-LOVING WOOD RAT (*Neotoma cinerea saxamans*, Osgood).

Male and female collected at Gopher Dam Mountain, Wilson Creek (altitude 3,500 feet), on July 15th. Two specimens preserved.

DRUMMOND'S MEADOW VOLE (*Microtus drummondi*, Audubon & Bachman).

Taken at Wilson Creek on June 11th and 28th; at Atlin on August 10th and 12th. Common. Ten specimens preserved.

CANTANKEROUS MEADOW VOLE (*Microtus mordax*, Merriam).

Four collected at Atlin on August 13th, 15th, and 16th. Three specimens preserved.

NORTHWEST TERRITORY MUSK RAT (*Fiber zibethicus spatulatus*, Osgood).

Male shot at Camp Lake, Wilson Creek, on June 20th. Female shot at Anderson Bay, Lake Atlin, on August 6th. Several others were seen swimming on some of the small lakes close to Atlin.

DALL'S LEEMING VOLE (*Synaptomys dalli*, Merriam).

Male taken at Wilson Creek on June 10th. One specimen preserved.

STIKINE JUMPING MOUSE (*Zapus princeps saltator*, Allen).

Female taken at Wilson Creek on July 15th. One specimen preserved.

MACFARLANE'S HARE (*Lepus americanus macfarlanei*, Merriam).

Abundant everywhere throughout the district. Thirty specimens, including eight young, were taken in June, July and August. Twenty-six specimens preserved.

PACIFIC MINK (*Mustela vison energumenos*, Bangs).

Adult female trapped at Hot Springs, Atlin Lake, on July 10th. The skin is very dark, with fine pelage for summer skin.

DUSKY SHREW (*Sorex obscurus*, Merriam).

Male taken at Wilson Creek on June 13th. Young male collected at Atlin on August 14th. Two specimens preserved.

NAVIGATOR SHREW (*Neosorex palustris navigator*, Baird).

An adult male taken at Hot Springs, close to shore of Atlin Lake, in July. Specimen preserved.

DARK YUMA BAT (*Myotis yumanensis saturatus*, Miller).

Two seen at Anderson Bay, Lake Atlin, on August 6th. They were undoubtedly this species, as two were taken in the same locality the year previous. (Although a sharp look-out for bats was kept, we found them unusually scarce.)

REVISED LIST OF MAMMALS COLLECTED IN THE OKANAGAN VALLEY IN 1913.

By E. M. Anderson.

(Identified by the Biological Survey of Washington, D.C.)

Streator's Chicaree, Squirrel (*Sciurus hudsonicus streatori*, Allen).

Common throughout the Okanagan Valley. Specimens collected at Penticton on April 8th and at Okanagan Falls from April 15th to June 6th. Twenty-three specimens preserved.

Allied Chipmunk (*Eutamias affinis*, Allen).

Very abundant at Okanagan Falls. A large series taken in April, May, and June in the various points collected at. Thirteen specimens preserved.

Columbian Spermophile (*Citellus columbianus*, Ord.).

Common on nearly all of the foot-hills throughout the valley. Secured specimens at Schoonover Mountain on April 20th, May 20th, and June 1st to 15th. Ten specimens preserved.

Dusky Flying Squirrel (*Sciuropterus alpinus fuliginosus*, Rhoads).

One taken at Shuttleworth Creek on May 10th. Three others were secured at Schoonover Mountain on June 1st, 3rd, and 6th. Four specimens preserved.

Yellow-bellied Marmot, Woodchuck (*Marmota flaviventer avarus*, Bangs).

Specimens taken at Shuttleworth Creek (Okanagan Falls) on April 15th, May 20th, and June 12th. Abundant throughout the valley. Six specimens preserved.

House Mouse (*Mus musculus*, Linnæus).

Common at Penticton and Okanagan Falls. Three were collected at Penticton on April 8th and 15th. One taken at Okanagan Falls on April 19th. Abundant at abandoned railway-construction camps throughout the valley.

Ashcroft, Deer Mouse (*Peromyscus maniculatus artemisiæ*, Rhoads).

This is the commonest mouse in the Okanagan Valley. Adults collected at Penticton on April 15th; at Okanagan Falls in May and June. Twenty specimens preserved.

Mountain Mouse (*Peromyscus oreas*, Bangs).

Found it only at Vaseaux Lake, where it frequented our camp. One male taken on May 20th and three females on May 27th. Four specimens preserved.

Western Bushy-tailed Wood Rat (*Neotoma cinerea occidentalis*, Baird).

Common in old cabins and mountain rock caves, etc. Specimens taken at Okanagan Falls on April 15th, collected at Schoonover Mountain on June 3rd and 4th, and a young male taken at Vaseaux Lake on June 18th.

Mountain Vole (*Phenacomys orophilus*, Merriam).

Two males taken at Schoonover Mountain (Okanagan Falls) on April 24th and June 1st. Two specimens preserved.

Grey Meadow Vole (*Microtus nanus canescens*, Bailey).

Taken at Schoonover Mountain (Okanagan Falls) on April 21st, June 5th, 6th, and 7th. Four specimens preserved.

Cantankerous Meadow Vole (*Microtus mordax*, Merriam).

Abundant in the mountain sections. Collected at Schoonover Mountain, Okanagan Falls, April 22nd to 25th; at Vaseaux Lake, May 26th; Schoonover Mountain, June 1st.

Swarth's Pocket Gopher (*Thomomys fuscus*, Merriam).

Abundant throughout the valley. Taken at Schoonover Mountain on June 3rd and at Penticton on June 3rd and 4th. Very common in the orchards near Penticton. Six specimens preserved.

Northwest Pocket Mouse (*Perognathus lordi*, Gray).

Male collected at Vaseaux Lake on May 27th. Apparently not common, as only one was taken. Specimen preserved.

British Columbian Hare (*Lepus americanus columbiensis*, Rhoads).

Common at Okanagan Falls. Taken April 20th, May 10th, and 22nd at Shuttleworth Creek.

Fort Yuma Bat (*Myotis yumanensis*, H. Allen).

Two specimens collected at Okanagan Falls on May 27th and June 18th.

Little California Bat (*Myotis californicus*, Audubon & Bachman).

The commonest species in the district. Collected at Okanagan Falls in May and June. Nineteen specimens preserved.

Silvery Bat (*Lasionycteris noctivagans*, Le Conte).

Taken at Vaseaux Lake on May 2nd, 20th, 22nd, and 24th. Five specimens preserved.

Brown Bat.

Female collected at Vaseaux Lake on May 20th. Several others were seen throughout the district collected in.

FISHES COLLECTED IN ATLIN, 1914.

By E. M. Anderson.

Lake Trout (*Christimover mamaycush*, Walbaum).

Two specimens taken from Atlin Lake on August 12th; very abundant.

Whitefish (*Coregonus sp.*).

Four specimens obtained from Atlin Lake on August 10th. Two distinct species are found in Atlin Lake.

Arctic Grayling (*Thymallus signifer*, Richardson).

Plentiful on most of the rivers and Atlin Lake. Specimens taken on August 4th at Pike River and on August 12th at Atlin Lake.

Bullhead (*Cottus sp.*).

Atlin Lake, August 8th.

Batrachians (Frogs), Atlin, 1914.

Rana sp.

Common at Hot Springs in July. Twenty-five specimens collected from July 15th to 20th. Found them in no other section.

ENTOMOLOGICAL SPECIMENS COLLECTED IN THE ATLIN DISTRICT, 1914.

Over 2,000 insects were collected, comprising several orders. Thirty-two forms of Diurnals (butterflies) were taken, many of which are new records for British Columbia. Noctuidæ (moths) were scarce, this being attributed to the little or no darkness during the summer months.

Following is a list of captures which have been authentically determined to date of publication. Numbers prefixed are according to Dyar's List of North American Lepidoptera, 1902.

LEPIDOPTERA.

(Identifiers' names are affixed in brackets.)

DIURNALS (BUTTERFLIES).

1c. *Parnassius smintheus var. nanus*, Neumœgen (Northern Parnassian).

Common at Pike River July 27th, 28th, and 29th. A large series of over a hundred were taken, including a number of well-marked females. (Barnes & McDunnough.)

36A. *Pontia occidentalis var. calyce*, Edwards (Western White).

Fairly common at Wilson Creek in June. This form is the commonest white in the north. (Barnes & McDunnough.)

38A. *Pontia napi var. bryoniæ*, Ochsenheimer (Alpine White).

Not common. Two specimens taken at Wilson Creek on June 12th. Also a single worn female at Hot Springs on July 7th. We noted several on the wing at Skagway, Alaska, on June 4th. It is possible they may have been the form *hulda*. (Barnes & McDunnough.)

. . . *Synclhœ creusa*, Doubleday & Hewitson.

Common at Wilson Creek, where a number were taken on June 8th to 30th. Mr. McDunnough says specimens examined are typical.

63A. *Eurymus hecla var. glacialis*, McLachlan.

A single specimen collected at Anderson Bay on August 8th near the top of a mountain at 5,000 feet altitude. No others were observed. (Barnes & McDunnough.)

65B. *Eurymus eriphyle*, Edwards.

Abundant. Several taken at Wilson Creek on June 9th to 29th. Also occurred commonly at Hot Springs in July. Albinic females were also taken. (Mr. McDunnough states that this is the true form without a doubt.)

72. *Eurymus scudderi*, Reak (Scudder's Sulphur).

Appeared at Wilson Creek on June 20th to 30th. Fifteen taken at Hot Springs and Pike River during July. (Barnes & McDunnough.)

102. *Argynnis atlantis*, Edwards.

Fairly common at Hot Springs on July 12th to 25th. Specimens taken were a trifle smaller than type forms from the Catskills, New York. (Barnes & McDunnough.)

128B. *Argynnis eurynome var. bischoffi*, Edwards.

Two specimens collected at Pike River on August 8th. Mr. McDunnough states this is the silvered form of *bischoffi*, Edwards, practically the same as *var. washingtonia*. (Barnes & McDunnough.)

128D. *Argynnis bischoffi var. opis*, Edwards.

A single specimen obtained at Pike River on August 8th. The type locality for *opis* is Cariboo District, but specimen is fairly typical. (Barnes & McDunnough.)

131. *Brenthis myrina*, Cramer (Silver-bordered Fritillary).

About fifty were taken at Hot Springs on July 5th to 9th, where it was common. Not observed in any other section.

134. *Brenthis triclaris*, Hubner.

Fairly common at Wilson Creek. A number were collected at Gopher Dam Mountain at about 4,500 feet altitude. Did not occur on the lower levels. All were taken from July 15th to 20th. Mr. McDunnough until further examination refers them at present to *Aphirape v. ossianus*, Boisduval.

137C. *Brenthis chariclea var. boisduvalii*, Dup. (Boisduval's Fritillary).

Appeared commonly at Wilson Creek from June 15th to 30th. At Hot Springs a number were captured as late as July 20th. (Barnes & McDunnough.)

138. *Brenthis freija*, Thunberg; *syn. freya*, H. & S.

We found this the commonest *Brenthis* in the district. It appeared in numbers at Wilson Creek from June 7th to 30th, where a number were taken. This species is the first fritillary to emerge, being the only form flying when we arrived at the creek. (Barnes & McDunnough.)

139. *Brenthis polaris*, Bdv.

Not common. Three specimens collected at Wilson Creek on June 15th and 26th. (Barnes & McDunnough.)

140a. *Brenthis frigga var. saga*, Kaden.

A number were taken at Wilson Creek from June 11th to 28th. Fairly common. (Barnes & McDunnough.)

140b. *Brenthis frigga var. improba*, Butler.

Eight specimens collected on the summit of Gopher Dam Mountain, 500 feet altitude. Mr. McDunnough states that it is paler above than the typical specimen, and is still rare in collections.

191. *Phycoides pratensis*, Behr.

Eight specimens taken at Hot Springs from July 10th to 26th. Not a common insect. (Barnes & McDunnough.)

218. *Aglais milberti*, Goddart (Milbert's Tortoise-shell).

Two seen at Pike River on August 8th. Probably common later in the fall.

270a. *Erebia disa var. mancinus*, Dby.

We found this beautiful form flying with *Erebia epipsodea* at Wilson Creek from June 11th to 30th. About thirty specimens were taken. By no means common. (Barnes & McDunnough.)

273. *Erebia epipsodea*, Butler (Common Alpine).

Common at Wilson Creek throughout the month of June. A good series of fresh specimens were taken. Mr. McDonnough reports the specimens submitted to him as a true typical form.

282. *Cœnonymphа kodiak*, Edwards.

Only two specimens taken at Wilson Creek on June 26th. These are the only two records we have from British Columbia. Apparently not common, as no others were seen. (Barnes & McDunnough.)

292. *Œnis jutta*, Hubner; *syn. Balder*, Bdv.

Not common. Eleven specimens taken at Wilson Creek during the last week of June. Fairly common. (Barnes & McDunnough.)

293. *Œnis uhleri*, Reakirt.

Rather common. Eleven specimens collected at Wilson Creek from June 15th to 30th. (Barnes & McDunnough.)

295f. *Œnis norna var. taygete*, Hubner.

Very common at Wilson Creek throughout the month of June. A large series of over a hundred were taken. This species is the common Arctic butterfly, and can be seen in numbers along the mountain trails and roadsides from 3,000 to 5,000 feet altitude. (Barnes & McDunnough.)

396. *Epidemia helloides*, Boisduval.

Two specimens collected at Hot Springs on July 26th and five at Pike River on August 3rd. (Barnes & McDunnough.)

Some of the *Epidemia* taken represent a form between *dorcas* and *xanthoides*. (McDunnough.)

409. *Cupido sæpiolus*, Bdv.

Common at Wilson Creek from June 8th to 30th. Also common at Hot Springs early in July. Specimens are rather off type. (Barnes & McDunnough.)

425. *Agriades aquilo*, Boisduval.

Thirty specimens collected at Wilson Creek from June 15th to 30th. Barnes & McDunnough identified it as an intermediate Western form between *aquilo*, Bdv., and *rustica*, Edwards.

432. *Rusticus scudderi*, Edwards.

Common at Wilson Creek in June and at Hot Springs in July. Over fifty specimens taken. The specimens are probably closer to true *scudderi* described from Lake Winnipeg than the Eastern form going under the same name. (McDunnough.)

644. *Hesperia centaureæ*, Rambur.

Only two specimens taken at Wilson Creek, one on June 22nd and another on June 29th. (Barnes and McDunnough.)

HETEROCERA (MOTHS).

(Identifiers' names are affixed in brackets.)

ARCTIIDÆ.

869. *Neoarctia yarrowi*, Stretch.

A perfect specimen taken at Wilson Creek on June 28th. Several others were seen on the wing in June. (Barnes and McDunnough.)

AGARISTIDÆ.

943. *Androloma mac-cullochii*, Kirb .

Fairly common in the mountainous sections in June. Specimens obtained at Wilson Creek from June 12th to 28th. (Barnes & McDunnough.)

NOCTUIDÆ.

1105. *Caradrina extimia*, Walker.

Three taken on August 20th at Atlin. (Barnes & McDunnough.)

1223. *Agroperina (Hadena) morna*, Strecker.

Single specimen taken at Pike River on July 29th, possibly a form of *morna*. (Barnes & McDunnough.)

1232. *Sidemia (Hadena) devastatrix*, Brace.

Atlin, August 15th, Cariboo Crossing, August 20th. (Barnes & McDunnough.)

1281. *Hyppa brunneicrista*, Smith.

One specimen taken at Hot Springs on July 6th, probably this species. (Barnes & McDunnough.)

1390. *Rhynchagrotis rufipectus*, Morrison.

Two specimens taken at Pike River on August 8th. (Barnes & McDunnough.)

1431. *Pachnobia littoralis*, Packard.

Single specimen on July 5th at Hot Springs is a form of *littoralis*. (Barnes & McDunnough.)

1489. *Agrotis (noctua) fennica*, Tauscher.

Five specimens taken at Atlin from August 8th to 12th. (Barnes & McDunnough.)

1736. *Euxoa (Paragrotis) divergens*, Walker.

Three specimens taken at Atlin on August 8th, 11th, and 12th. Mr. McDunnough is not quite sure of the identity of this species.

1737. *Euxoa redimicula*, Morrison.

Common at Atlin from August 9th to 19th. Eight specimens collected. (Barnes & McDunnough.)

1798. *Mamestra olivacea var. lucina*, Smith.

Single specimen collected at Atlin on August 8th. (Barnes & McDunnough.)

1840. *Mamestra sutrina*, Grote.

Single specimen collected at Wilson Creek on June 6th. (Barnes & McDunnough.)

1930. *Anarta cordigera*, Thunberg.

Common at Wilson Creek in June. Eleven specimens taken. (Barnes & McDunnough.)

1932. *Anarta melanopa*, Thunberg.

Not common. Three specimens collected at Wilson Creek from June 14th to 18th. (Barnes & McDunnough.)

1935. *Anarta richardsoni*, Curtis.

One specimen taken at Hot Springs on July 7th. (Barnes & McDunnough.)

1936. *Anarta ? sp.*

A single specimen, possibly a dark form of *impinigens*, Walker, was taken at Atlin on August 15th. (Barnes & McDunnough.)

1974. *Cirphis (Heliophila) heterodoxa*, Smith.

One specimen taken at Hot Springs on July 17th. (Barnes & McDunnough.)

2533. *Autographa (Syngrapha) ignea*, Grote.

Four taken at Pike River from July 27th to 29th. (Barnes & McDunnough.)

.... *Autographa orophila*, Hampson.

Two taken at Pike River on July 29th. (Barnes & McDunnough.)

3223. *Epicnaptera americana*, Harris.

A female collected at Wilson Creek on June 21st. (Barnes & McDunnough.)

4197a. *Albuna pyramidalis var. montana*, Hy. Edwards.

Three collected at Wilson Creek on June 28th. (Barnes & McDunnough.)

GEOMETRIDÆ.

(Identifiers' names are affixed in brackets.)

3255. *Philopsia (Talledega) montanata*, Packard.

Common at Wilson Creek in June; specimens taken on June 12th, 16th, 21st, and 27th. (L. W. Swett.)

.... *Eupithecia adornata*, Taylor.

Three taken at Wilson Creek on June 20th and 21st. (L. W. S.)

3350. *Eustroma propulsata*, Walker.

Taken At Atlin on August 11th. (E. H. Blackmore.)

3351a. *Eustroma destinata var. lugubrata*, Moschler.

A single specimen taken at rest on a fence at Atlin on August 13th. (L. W. S.)

3353. *Eustroma nubilata*, Packard.

Wilson Creek, June 26th. (E. H. B.)

3359b. *Rheumaptera hastata var. hastulata*, Hubner.

Common at Wilson Creek from June 9th to 30th. (L. W. S.)

3360. *Rheumaptera tristata*, Linnæus.
Fairly common at Wilson Creek from June 16th to 28th. (E. H. B.)

3362. *Rheumaptera luctuata*, Dennis & Schiffermuller.
Wilson Creek, June 15th to 20th. (L. W. S.)

3362A. *Rheumaptera luctuata var. obducata*, Moschler.
Wilson Creek, June 26th to 28th. (L. W. S.)

3379B. *Mesoleuca citrata var. suspectata*, Moschler.
Wilson Creek, June 14th. (E. H. B.)

3381. *Mesoleuca silaceata*, Hubner.
Common in the mountainous sections in June. A good series taken at Wilson Creek. (E. H. B.)

3387C. *Hydriomena furcata var. quinquefasciata*, Packard.
Very abundant throughout the month of June at Wilson Creek. (L. W. S.)

3419. *Hydriomena magnoliata*, Guenee.
Found it common at Wilson Creek from June 18th to 30th. (E. H. B.)

3434. *Stamnoedes (Cœnocalpe) topazata*, Strecker.
Fairly common at Wilson Creek in June. Previous record Mount Cheam. (E. H. B.)

3449. *Petrophora salvata*, Pearsall; *incursata*, Hubner.
Taken at Wilson Creek on June 30th. (L. W. S.)

3450. *Petrophora abrasaria*, Herrich-Schaeffer.
Common at Wilson Creek in June. (L. W. S.)

3603. *Epelis truncataria*, Walker.
Fairly common at Wilson Creek from June 12th to 30th. (E. H. B.)

3777. *Enypia perangulata*, Hulst.
Single specimen taken at Carcross on August 20th. (E. H. B.)

3878. *Jubarella danbyi*, Hulst.
Two specimens taken at Wilson Creek on June 26th and 28th. (E. H. B.)

PYRALIDÆ.

1404. *Phlyctænia itysalis*, Walker.
Common at Hot Springs on July 17th. (Barnes & McDunnough.)

. *Phlyctænia sp?*
Pike River, August 8th; possibly *tellealis*, Dyar. (Barnes & McDunnough.)

4504. *Scoparia lugubralis*, Walker.
Hot Springs, July 4th. (Specimens rubbed; the identification is not certain.) (Barnes & McDunnough.)

.... *Scoparia sp?*
Hot Springs, July 7th. (Barnes & McDunnough.)

4510. *Scoparia centuriella*, Dennis & Schiffermuller.
Very common at Wilson Creek in June. A large series of this species were collected. Very variable. (Barnes & McDunnough.)

4563. *Crambus pascellus*, Linnæus.
Common at Hot Springs. Several taken from July 5th to 10th. (Barnes & McDunnough.)

1583. *Crambus myellus*, Hubner.

Fairly abundant at Hot Springs. Specimens were taken on July 4th, 5th, and 6th. (Barnes & McDunnough.)

1776. *Laodamia fusca*, Harworth.

Nine specimens taken at Wilson Creek from June 15th to 30th. (Barnes & McDunnough.)

5071. *Olethreutes bipartitana*, Clemens.

Common. Six specimens taken at Hot Springs on July 8th and 12th. (Barnes & McDunnough.)

.... *Hysterosia homonana*, Kearfoot.

A single specimen taken at Hot Springs on July 8th. (Barnes & McDunnough.)

TINEIDÆ.

.. *Memotois bellela*, Walker.

One specimen taken at Hot Springs on July 4th. (Barnes & McDunnough.)

DIPTERA. (ATLIN, 1914.)

(Idt. by Raymond C. Osburn.)

TABANIDÆ.

Tabanus affinis, Kirby.
Tabanus sp.?
Tabanus osburni, Hine.

BOMBYLIDÆ.

Anthrax fulviana, Say.

SYRPHIDÆ.

Syrphus contumax, O. Sacken.
" *intrudens*, O. Sacken.
" *(catabomba) pyrastri*, Linnæus.
" *torvus*, O. Sacken.
Hammerschmiatia ferruginia, Fallen.
Ersitalis rupium, Fabricus. New to America; common in Europe.
Melanostoma sp (Prob. new sp.)

ODONATA (DRAGON-FLIES). (ATLIN, 1914.)

(Idt. by Raymond C. Osburn and E. B. Williamson.)

Aeshna sitchensis, Hagen. (Osburn.)
" *eremista*, Scudder. (Osburn.)
Enallagma calverti, Morse. (Osburn.)
" *cyathigerum*, Charpentier. (Osburn.)
Leucorhinia hudsonica, Selys. (Williamson.)
" *proxima*, Calvert. (Williamson.)
Somatochlora hudsonica, Hagen. (Osburn.)

SUPPLEMENTARY LIST OF INSECTS COLLECTED IN THE OKANAGAN, 1913

(Identifiers' names are affixed in brackets.)

Arctiidæ.

833. *Eubaphe immaculata*, Reakirt.
Penticton, June 27th, 1913. (Wolley Dod.)

Noctuidæ.

1226. *Hadena cogitata*, Smith.
Penticton, July 7th. (W. D.)

1496. *Noctua unicolor*, Walker; *syn. clandestina*, Harris.
Five specimens taken at Penticton on June 28th. (W. D.)

1708. *Hadenella subjuncta*, Smith.
Three specimens taken at light, Penticton, July 3rd. (W. D.)

1894. *Xylomiges dolosa*, Grote.
Fairly common on peach-blossoms at Okanagan Falls, May 5th. (W. D.)

1895. *Xylomiges rubrica*, Harvey.
Okanagan Falls, May 5th. Very common on peach-blossoms. A large series of 220 taken. Very variable. (W. D.)

. . . *Stretchia angula*, Smith?
Five taken at Okanagan Falls on May 6th, 8th, and 12th. (Mr. Wolley Dod states specimens examined agree with the description of types from Arrow Head Lake, B.C., but he never saw the species before.)

2102. *Xylina georgii*, Grote; *syn. holicineria*, Smith.
Seven taken at Okanagan Falls from May 5th to 30th. (W. D.)

2120. *Colocampa cineritia*, Grote; *syn. mertena*, Smith.
Five collected at Okanagan Falls on May 6th and 10th. (W. D.)

2142. *Rancora strigata*, Smith.
Five fresh specimens taken at light at Okanagan Falls on May 5th, 7th, and 8th. (W. D.)

2240. *Scopelosoma tristigmata*, Grote.
Okanagan Falls, May 7th. (W. D.)

2405. *Melicleptria honesta*, Grote.
Vaseaux Lake, Okanagan Falls, May 26th. (W. D.)

2601. *Eustrotia albidula*, Guenee.
Penticton, June 30th, three taken at light. (W. D.)

2761. *Syneda (euclidia) annexa*, Hy. Edwards.
Common at Okanagan Falls from April 26th to May 7th. (W. D.)

Hypeninæ.

3008. *Epizeuxis americalis*, Guenee.
Penticton, June 30th. Mr. Wolley Dod states that it appears to be very rare in British Columbia, the only previous record being one from the late G. W. Taylor's collection.

3039a. *Chytolita petrealis*, Grote.
Penticton, June 21st. (W. D.)

3168. *Gluphisa severa*, Hy. Edwards.
Two taken at Okanagan Falls on April 24th. (W. D.)

GEOMETRIDÆ.

3237. *Cladora atroliturata*, Walker.
Okanagan Falls, April 20th and 22nd. (L. W. Swett.)

.... *Nausina (Gymnocelis) melissa*, Grosbeck.
Okanagan Falls, May 19th. (L. W. S.)

3316. *Eupithecia cestata*, Hulst.
Okanagan Falls, April 18th and 20th. (L. W. S.)

3318. *Eupithecia implorata*, Hulst.
Okanagan Falls, April 18th to 22nd, fairly common at light. (L. W. S.)

3321. *Eucymatoge tennata*, Hulst.
Okanagan Falls, June 10th. (L. W. S.)

3436. *Marmopteryx marmorata*, Packard.
Two taken at Shuttleworth Creek, Okanagan Falls, May 7th and 10th. (L. W. S.)

... *Leptomeris subfuscata*, (Taylor).
Fairly common at Shuttleworth Creek, Okanagan Falls, May 23rd and 30th. (L. W. S.)

3550. *Leptomeris (Eois) sideraria*, Guenee.
Okanagan Falls, June 10th and 12th, common. (L. W. S.)

3623. *Deilinia variolaria* Guenee.
Penticton, July 3rd. (L. W. S.)

3648. *Sciagraphia denticulata*, Grote.
Okanagan Falls, May 6th to 8th. (L. W. S.)

3662. *Sciagraphia excurvata*, Packard.
Okanagan Falls, May 9th. (L. W. S.)

3792. *Alcis dissonaria*, Hulst.
One specimen taken at Okanagan Falls on May 5th and another at Penticton on June 30th.

3850. *Cleora pampinaria*, Guenee.
Penticton, July 6th. (L. W. S.)

3867. *Lycia cognataria*, Guenee.
Penticton, June 30th and July 2nd. (L. W. S.)

3960. *Euchlaena johnsonaria*, Fitch.
Okanagan Falls, June 25th.

THYRIDÆ.

4131. *Thyris maculata*, Harris.
Okanagan Falls, June 8th. (Wolley Dod.)

GEOMITRIDÆ (ATLIN, 1913).

3343. *Eutephria (philereme) multivagata*, Hulst.
Atlin, September 9th. (L. W. S.)

3380A. *Mesoleuca citrata*, Linnæus.
September 12th and 13th. (L. W. S.)

LIST OF HYMENOPTERA COLLECTED AT OKANAGAN FALLS, 1913.

(Idt. by J. C. Crawford.)

Bombus occidentalis. Okanagan Falls, May 13th to 27th.
〃 *edwardsii.* Okanagan Falls, April 19th to 22nd, May 3rd.
〃 *separatus.* Okanagan Falls, May 27th.
〃 *oppositus.* Okanagan Falls, June 13th to 27th.
Psithyrus insularis. Okanagan Falls, June 6th.
Halictus lerouxii. Okanagan Falls, April 19th.
〃 *trizonatus.* Okanagan Falls, June 12th.
Agapostemon femoratus (?). Okanagan Falls, June 13th.
Bombomelerta fulvida. Okanagan Falls, April 19th to 26th.
Anthophora solitaria, Ritz. Okanagan Falls, June 2nd.
Sphecodes hesperellus. Okanagan Falls, June 2nd.
Andrena kincaidii, Ckll. Okanagan Falls, May 13th.
〃 *vicina*, Smith. Okanagan Falls, May 7th.
Ceratina submaritima. Okanagan Falls, June 12th.
Megachile sp. Okanagan Falls, June 5th.
Osmia sp. (two distinct var.). Okanagan Falls, June 2nd.
Anthophora sp. Okanagan Falls, May 28th.

ACCESSIONS.

Jan. 4. Canvas-back. Presented by Eric Leighley, Departure Bay, Vancouver Island.
〃 10. 4 Moose (cow, 2 bulls, and calf).
7 Ptarmigan
3 Pine Grosback } Sucker Lake, Atlin, B.C. Purchased.
4 Musk-rat
〃 16. Indian carving on slate, representing "Thunderbird." Presented by J. C. Lowe, Victoria.
〃 20. Indian carving on sandstone, found September 1913, on Nass River above Meziadin River, and presented by Jno. Coughlan, Stewart, B.C.
〃 21. Indian stone implement (found, 1899); Indian arrow-points (found, 1913). Presented by Robert Wood. Found at Armstrong, B.C.
〃 22. Black Rat. Presented by F. Dangerfield, Victoria.
〃 20. 1 Gairdner's Woodpecker, Victoria District. E. M. Anderson.
〃 27. 1 Northwestern Flicker (hybrid), Victoria District. E. M. Anderson.
〃 27. 2 Oregon Towhee, Victoria District. E. M. Anderson.
〃 20. 1 Northwestern Flicker, Victoria District. E. M. Anderson.
〃 20. 1 Steller's Jay, Victoria District. E. M. Anderson.
〃 27. 1 Northwestern Crow, Victoria District. E. M. Anderson.
〃 30. 1 Rusty Song Sparrow, Victoria District. E. M. Anderson.
〃 30. 2 Sooty Fox Sparrow, Victoria District. E. M. Anderson.
〃 30. 1 Oregon Junco, Victoria District. E. M. Anderson.
〃 30. 2 Gairdner's Woodpecker, Victoria District. E. M. Anderson.
Feb. 3. 1 Short-billed Gull, Victoria District. E. M. Anderson.
〃 3. 1 Gairdner's Woodpecker, Victoria District. E. M. Anderson.
〃 3. 1 Varied Thrush, Victoria District. E. M. Anderson.
〃 3. 1 Western Robin, Victoria District. E. M. Anderson.
〃 3. 1 Kennicott's Screech Owl, Victoria District. E. M. Anderson.
〃 3. 1 Steller's Jay, Victoria District. E. M. Anderson.
〃 4. 1 Clarke's Crow, Victoria District. E. M. Anderson.

Feb. 9. 3 Steller's Jay, Victoria District. E. M. Anderson.
〃 10. 1 Northwestern Saw-whet Owl, Victoria District. E. M. Anderson.
〃 13. Noduled Crab, Esquimalt Harbour. Presented by Captain Chas. Mayer, yacht "Adventuress."
〃 16. 1 Short-eared Owl, Victoria District. E. M. Anderson.
〃 18. 1 Marbled Murrelet, Victoria District. E. M. Anderson.
〃 18. 1 Clarke's Crow, Victoria District. E. M. Anderson.
〃 24. Marmot-skull (deformed incisors, unusual growth). Taken by J. Ross, of Fort Grahame, and presented by Geo. V. Copley, Victoria
〃 27. 1 Shoveller, Abbotsford, New Westminster. Presented by Mr. Peel.
〃 28. 1 California Pigmy Owl. Presented by Junior Audubon Society, Nelson, B.C.
March 1. 1 Western Evening Grosbeck. Presented by Herbert M. T. Hodgson, Port Alberni, B.C.
〃 3. 1 Scaup Duck (showing albinism). Presented by A. B. Williams, Provincial Game Warden, Vancouver.
〃 12. 3 White-tailed Ptarmigan, Atlin, B.C. Alex. Smith and W. Taku.
〃 12. 5 Willow Ptarmigan, Atlin, B.C. Alex. Smith and W. Taku.
〃 12. 3 Alaskan Pine Grosbeak, Atlin, B.C. Alex. Smith and W. Taku.
〃 12. 3 Musk-rat, Atlin, B.C. Alex. Smith and W. Taku.
〃 14. 2 Grey-ruffed Grouse, Kamloops. Deputy Game Warden Woods.
〃 14. 5 Franklin's Grouse, Kamloops. Deputy Game Warden Woods.
〃 14. 3 Columbian Sharp-tailed Grouse, Deputy Game Warden Woods.
〃 14. 1 Fannin's Heron. Jno. Graham.
〃 31. 1 Harris' Woodpecker, Victoria District. E. M. Anderson.
April 3. Young Cohoe Salmon, lake—near Nanaimo. E. Gordon Kermode.
〃 3. Columbia Chub, lake—near Nanaimo. E. Gordon Kermode.
〃 13. 1 Dolly Varden Trout, Coquihalla River, Hope, B.C. Presented by J. D. Forsyth, Vancouver.
〃 15. Eggs of Peale's Falcon. C. deB. Green, Masset.
〃 15. 1 Northwestern Flicker, Saanich, B.C. E. M. Anderson.
〃 15. 3 Northwestern Redwing, Saanich, B.C. E. M. Anderson.
〃 15. 1 Northern Violet-green Swallow, Saanich. E. M. Anderson.
〃 15. 2 Lutescent Warbler, Saanich, B.C. E. M. Anderson.
〃 15. 1 Oregon Junco, Saanich, B.C. E. M. Anderson.
〃 15. Varied Thrush, eggs and nest. C. deB. Green, Masset.
〃 17. Snake Blennie, Dallas Road, beach, Victoria. Presented by W. Richards.
〃 17. Moon-shell, Gulf of Georgia. Presented by W. R. Collister, Vancouver, B.C.
〃 22. 2 Sooty Grouse, Malahat, Vancouver Island. E. M. Anderson.
〃 23. Mounted specimens of Lepidoptera. E. H. Blackmore, Victoria.
Including: 10 *Parnassius clodius.*
2 *Papilo eurymedon.*
2 *Pieris rapæ var. marginalis.*
6 *Lemonias taylori.*
1 *Basilarchia lorquini.*
6 *Epidemia helloides.*
6 *Anthomaster agricola.*
1 *Thorybes pylades.*
2 *Thanaos propertius.*
May 6. Small-mouthed Bass, Vaseaux Lake, Okanagan. Presented by W. Hine.
〃 11. Water-beetle, Kamloops, B.C. Presented by S. W. Batten, 150-Mile House, Cariboo.
〃 18. Collection of Indian curios, including:
Bracelet of trade wire
Perforated tooth
Tooth-shaped bone
Polished stone
Whetstone
} Presented by E. W. Abraham, Vargas Island.
〃 28. Nest and eggs of California Partridge, Victoria, B.C. Presented by G. H. Hunter.

June 10. 2 Moths, Polyphemus and Sphynx, White's Landing, Fraser River. Presented by L. Higgins, Prince George, B.C.
" 12. 2 eggs of Loon, Penuse Lake, Yale District. Presented by Reg. Sweet.
" 15. Bison-skull, 3 feet underground, at Wilson Creek, Atlin. E. M. Anderson.
" Collection of 300 entomological specimens, Chilcotin District. W. A. Newcombe.
" — Shufeldt's Junco, nest and eggs, Chilcotin District. W. A. Newcombe.
" — Richardson's Grouse (4 eggs hatched), Chilcotin District. W. A. Newcombe.
" — 1 Frog, Chilcotin District. W. A. Newcombe.
" — 1 Toad, Chilcotin District. W. A. Newcombe.
" — 2 Larvæ, Meuroptera, Chilcotin District. W. A. Newcombe.
" — 1 Red-shafted Flicker and two eggs, Chilcotin District. W. A. Newcombe.
" — 5 White-footed Mice, Chilcotin District. W. A. Newcombe.
" — 1 Mammal-tooth, Chilcotin District. W. A. Newcombe.
" — 1 Porcupine-skull, Chilcotin District. W. A. Newcombe.
July 30. Milbert's Tortoise-shell Butterfly, Parksville, B.C. Presented by R. Rushton.
Aug. 21. Steller's Jay (showing albinism), Cobble Hill, V.I. Presented by Maurice Barry.
" 20. Butterfly, Milbert's Tortoise-shell (Melanistic). Presented by Jno. Clarke, Victoria.
Sept. 2. Larvæ, Papilio, Victoria, B.C. Presented by P. M. F. Clough.
" 2. Larvæ, Papilio, Cowichan Bay, V.I. Presented by J. Young.
" 2. 1 Black Spermophile, Carcross, Y.T. Presented by Leo. Simmons.
" 3. 1 Frog, Vernon, B.C. Max Ruhman.
" 9. 1 Hairworm, Nanaimo. Presented by V. B. Harrison.
" 14. 2 Chrysalis Papilio, Victoria, B.C. Presented by A. Francis.
" 21. Hog's tooth, Victoria, B.C. Presented by Robt. Thomas.
" 23. 1 Virginia Rail, Victoria, B.C. Presented by H. Aitkin.
" 23. 1 Northwestern Coast Heron, Parsons Bridge, V.I. Presented by Wallace K. Crockett.
Oct. 2. Specimens of fossil shells, Winter Harbour. J. S. Behnsen.
" 16. 1 Blue-bellied Lizard, Prince Rupert. Presented by M. L. Bird.
" 17. 1 Willow Goldfinch, Victoria District. E. M. Anderson.
" 26. 1 Western Red-tail, Cedar Hill. S. Whittaker.
" 26. 1 California Partridge, Cedar Hill. S. Whittaker.
" 26. 1 Lewis' Woodpecker, Dewdney, B.C. Miss S. A. Mills.
" 26. 1 Western Flycatcher, Victoria. F. Kermode.
Nov. 13. 2 Western Evening Grosbeak, Saanich, B.C. A. H. Maynard.
" 18. 5 Western Golden-crowned Kinglet, Victoria. E. M. Anderson.
" 18. 3 Oregon Junco, Victoria District. E. M. Anderson.
" 18. 1 Varied Thrush, Victoria District. E. M. Anderson.
" 27. 1 Black Rat, Victoria. Presented by Edward Cooke.
" 29. 1 Pine Siskin, Victoria District. E M. Anderson.
" 29. 2 Western Winter Wren, Victoria District. E. M. Anderson.
" 29. 2 Chestnut-backed Chickadee, Victoria District. E. M. Anderson.
Dec. 1. 1 Vancouver Chicaree, Victoria District. E. M. Anderson.
" 1. 1 Northwestern Crow, Victoria District. E. M. Anderson.
" 1. 3 Harris' Woodpecker, Victoria District. E. M. Anderson.
" 1. 4 Western Winter Wren, Victoria District. E. M. Anderson.
" 1. 2 Western Golden-crowned Kinglet, Victoria District. E. M. Anderson.
" 1. 1 Sooty Fox Sparrow, Victoria District. E. M. Anderson.
" 3. 1 Dusky Horned Owl, Okanagan Landing. W. R. Moore.
" 4. Rufous Hummingbird nest and eggs, Victoria. N. Blyth.
" 4. Nest of Alaskan Yellow Warbler, Victoria. N. Blyth.
" 9. Skin of Yellow-haired Porcupine, Okanagan Landing. J. A. Munro.
" 9. 2 shells, 1 *Epidemia mariposa*. C. deB. Green, Masset.
" 9. Mastodon-tooth } Dago Gulch, on Hunker Creek (1903), bequeathed
" 9. Mammoth-tooth (small) } by Mrs. C. A. Coulson.

Dec.	9.	Mammoth tooth	Chicken Creek, near 40 Mile (1908), bequeathed by Mrs. C. A. Coulson.
"	9.	Mammoth tusk	
"	9.	Mammoth-tusk (portion of)	
"	15.	Killdeer Plover, Alberni, B.C.	Presented by Deputy Game Warden Carter.

ACCESSIONS, 1913. (OMITTED FROM 1913 REPORT.)

Aug.	29.	Kelp, with parasitic growth.	Presented by W. H. Ellis, Victoria.
Sept.	15.	Musk-rat.	Kermode and Anderson, Atlin, B.C.
"	26.	" (Albino).	Presented by W. Vanvolkenberg, Atlin, B.C.
Oct.	—	1 Sockeye Salmon	Presented by M. McTavish, Rivers Inlet, B.C.
"	—	2 Banded Sailor Fish	
"	—	Diseased growth on salmon	
"	—	1 Blennie	

ANTHROPOLOGY.

REPORT OF C. F. NEWCOMBE, M.D., FOR 1914.

VICTORIA, B.C., December 31st, 1914.

F. Kermode, Esq.,
Director, Provincial Museum, Victoria.

SIR,—Owing to various causes the strictest economy has been exercised in curtailing the expenditure of the appropriation voted for the year 1914 for the purchase of anthropological specimens for the Provincial Museum.

Therefore only one field expedition was made, from May 14th to May 28th. This was to the Kwakiutl region near Alert Bay, Fort Rupert, and Blunden Harbour. It was successful in acquiring a series of ceremonial objects relating to the important cannibal winter dance of these people, and in filling up some of the blanks in the series illustrating their every-day life.

A few specimens have been acquired by correspondence, and some have been presented by various donors whose names will be found in the appended list of accessions for the current year.

Acknowledgment should also be made of the attempt of the Women's Canadian Club of Victoria to purchase and present to the Museum a totem-pole from Rivers Inlet. After agreeing to sell this pole at a certain price the native owner changed his mind, and the negotiation came to an end through no fault of the would-be donors or of the gentleman who acted as their agent. The totem-pole referred to would have been a valuable addition to the Museum, as Rivers Inlet is not represented in our collection. From other Kwakiutl villages, however, we have no less than eight of these poles; so that, as a whole, this tribe has had justice done to it.

An annotated list of specimens collected during the year 1914 is appended hereto.

I have, etc.,
C. F. NEWCOMBE, M.D.

SPECIMENS COLLECTED BY C. F. NEWCOMBE, M.D., 1914.

Haida.

Climbing outfit.
Bark-stripper.
Chisel.
Baskets (3).
Paddles (2).
Kelp fish-line.
Nose ornament of abalone.
Charm of abalone.

Kwakiutl.

Totem-poles (5).
Land-trap models (3).
Fish-trap models (2).
Hat.
Hat-cover.
Mask, Tsekiwi.
〃 Galukwiwi.
〃 Waakshan.
Bearskin blanket.
Skull head-dress.
Neck rings of cedar bark (3).
Face-mask of cedar bark.
Rattles (3).
Whistles (16).
Head-bands cedar bark (2).
Apron of cedar bark.
Cape 〃
Armlets 〃 (1 pr.)
Anklets 〃 (2 pr.)
Knee-bands 〃 (1 pr.)
Nettle fibre beater.
War-club of stone.
Mask, Hamatsa's raven.
〃 Sisiutl.
〃 Ya-akim.
Copper-breaker's anvil.
Paddle. carved.
Pile-driver, stone.
Slave-killer (model).

Nootkan.

Chief's stick.
Daggers (2), models.
Club, model.
Slave-killers (2), models.
Knife, model.
Adze, model.
Charm, model.
Ceremonial cups (2), models.
Fish-traps (2), models.
Dentalia spear.

Salish.

Basket, Sechelt make.
Wampum of stone.
House-boards (2).
Carved bone.

Bella Coola Salish.

Blanket.

Kootenaiain.

Basket.

Athapascan (?).

Marmot-skin blankets (3).

Athapascan-Chilcotin.

Baskets (3).
Marmot-skin blankets (2).

Presentations.

Haida skull and jaw.
Salish stone sinker.
Salish stone mortar.

Presented by Sir J. Jackson (Canada) Co., Ltd., Ogden Point, Victoria, through H. A. Elgee.

Stone implements, presented by Capt. F. Saunders, Digby Island.

Collections of J. A. Teit from the Interior of British Columbia, 1914.

Ntlakyapmuk or Couteau tribe (Interior Salish).

- Boy's suit consisting of—
    - Head-band of buckskin and feathers.
    - Leggings of caribou-skin.
    - Breech-clout.
    - Shirt of buckskin, fringed and beaded.
- Woman's costume consisting of—
    - Cap of buckskin, ornamented.
    - Dress of caribou-skin, ornamented.
    - Leggings of buckskin, fringed.
    - Leggings, buckskin, fringed.
    - Dress of buckskin, ornamented.
- Man's head-bands (2) of buckskin and feathers.
- Head-band of musk-rat skins and buckskin, ornamented.
- Head-band of rabbit-skin and buckskin.
- Woman's head-bands (2) of buckskin.
- Man's cap of skin of heron.
- Man's cap of squirrel-skins, etc.
- Woman's cap of buckskin.
- Chief's bonnet, buckskin, ornamented with feathers, ermine, etc.
- Pendant, dressed moose-skin, feathers, etc.
- Woman's dance-dress of netted Indian hemp, etc.
- Neck-wrap of rabbit-skin and buckskin.
- Cape of rabbit-skin.
- Cape of marmot-skin and buckskin.
- Large robe of 23 hoary marmot-skins.
- Man's hunting-shirts (2) of buckskin.
- 〃 moccasin of buffalo-skin.
- 〃 Breech-clout of buckskin.
- 〃 leggings (2 pair) of buckskin.
- Baskets, coiled (9).
- Basket, birch-bark.
- 〃 willow-bark.
- Bridle of horsehair.
- Stirrups of mountain-sheep horn.
- Whip of mountain-maple wood.
- Stone war-club.
- Black pipe.
- Time-beater.
- Iron ring used in ring and lance game.
- Wooden stick used in ring and lance game.
- Set of lynx-bones for lehal game.
- Girl's paint-scratcher.
- 〃 comb.
- 〃 drinking-tube.
- 〃 wiper of bark.
- Fire-drill.
- Wooden spoon.
- Rawhide bag.
- Bags (3) of elæagnus bark.
- Carrying-bag of buckskin.
- Mat of elæagnus bark.
- 〃 rushes.

Athapascan (Tahltan Tribe).

- Robe of 90 skins of ground-squirrel lined with blanket.

ILLUSTRATIONS ANTHROPOLOGY.

Plate I.—

Fig. 1. Chief's Ceremonial Blanket, Killer Whale Design, Salish, Bella Coola. $\frac{2326}{1206}$
Fig. 2. Ceremonial Blanket, Salish, Bella Coola. $\frac{2324}{376}$

Plate II.—

Fig. 3. Ceremonial Blanket, Salish, Capilano.
Fig. 4. Drying Bear-skin on Frame, Tsimshian, Nass River.

Plate III.—

Fig. 5. Totem-pole, Tsimshian, Gitex, Nass River. Photo by W. A. Newcombe.
Fig. 6. Totem-pole, Tsimshian, Gitex, Nass River. Photo by W. A. Newcombe.

Plate IV.—

Fig. 7. Totem-pole, Tsimshian, Angidah, Nass River. Photo by W. A. Newcombe.
Fig. 8. Totem-poles, Tsimshian, Angidah, Nass River. Photo by W. A. Newcombe.

Plate V.—

Figs. 9 and 10. Totem-poles, Tsimshian, Kitladamix, Nass River. Photos by W. A. Newcombe.

Plate VI.

Fig. 11. Cannibal Bird Mask, Kwakiutl, Blunden Harbour. $\frac{1918}{1148}$
Fig. 12. Cannibal Bird Mask, Kwakiutl, Blunden Harbour. $\frac{1917}{1147}$

Plate VII.—

Fig. 13. Cannibal Raven Mask, Kwakiutl, Blunden Harbour. $\frac{1953}{1183}$
Fig. 14. Cannibal Bird Mask (double), Kwakiutl, Blunden Harbour. $\frac{1916}{1146}$

Plate VIII.—

Fig. 15. Clan Spirit Mask, closed, Kwakiutl. $\frac{1952}{1184}$
Fig. 16. Clan Spirit Mask, open.

Plate IX.—

Fig. 17. Fish-trap, Nootka. $\frac{2220}{1203}$
Fig. 18. Fish-trap, Bella Coola. [illegible]

Plate X., Ceremonial Batons, illustrating crests and legends—

Fig. 19. Kwakiutl of Knight's Inlet. $\frac{1989}{972}$
Fig. 20. Kwakiutl of Fort Rupert. $\frac{1988}{971}$
Fig. 21. Kwakiutl of Bella-Bella. $\frac{2312}{321}$
Fig. 22. Nootkan of Mowichat. $\frac{2111}{1119}$

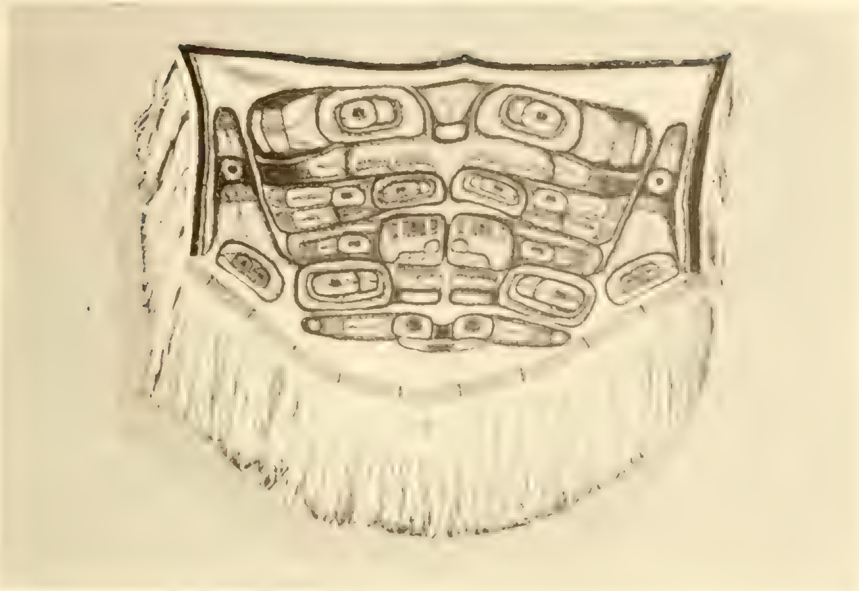

Fig. 1

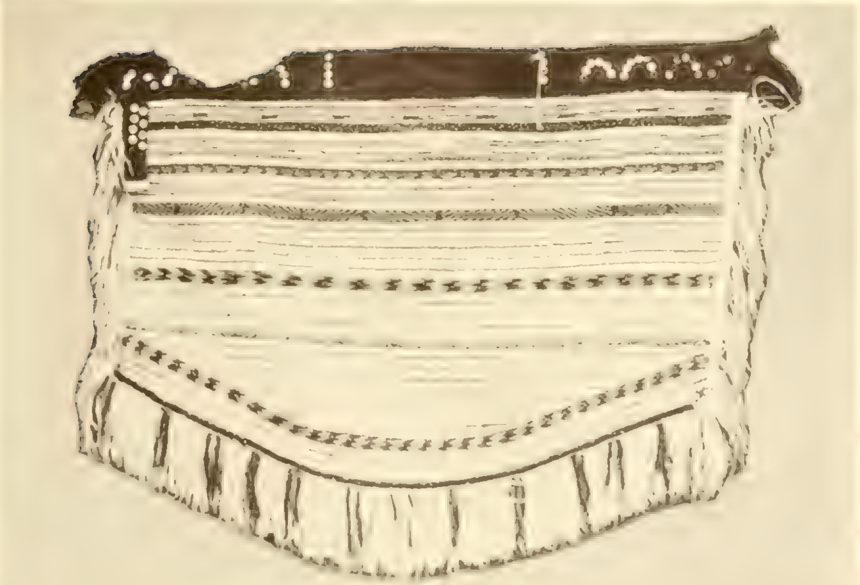

Fig. 2

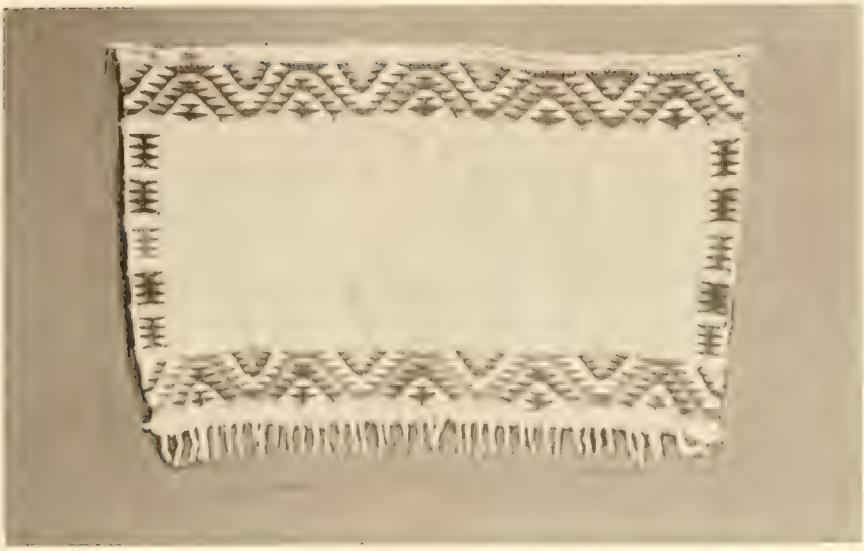

Fig. 3

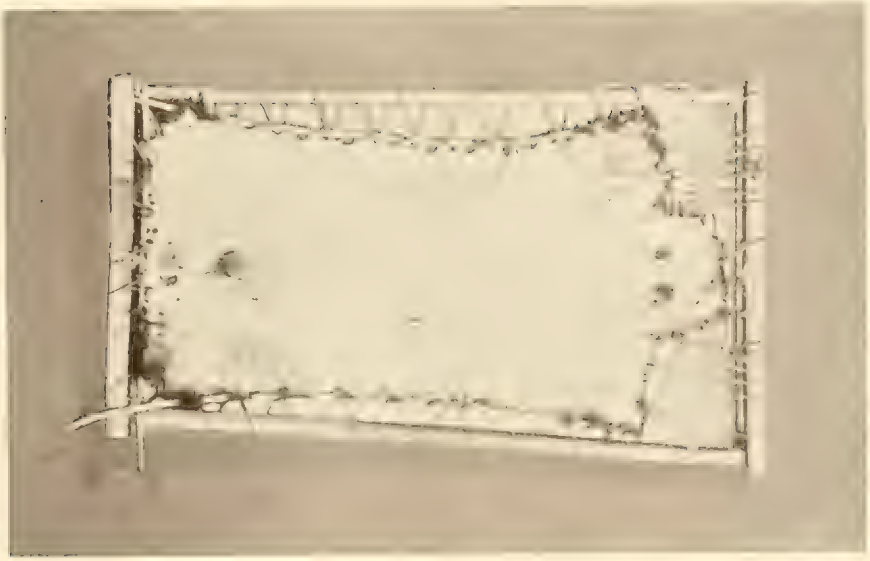

Fig. 4

PLATE III.

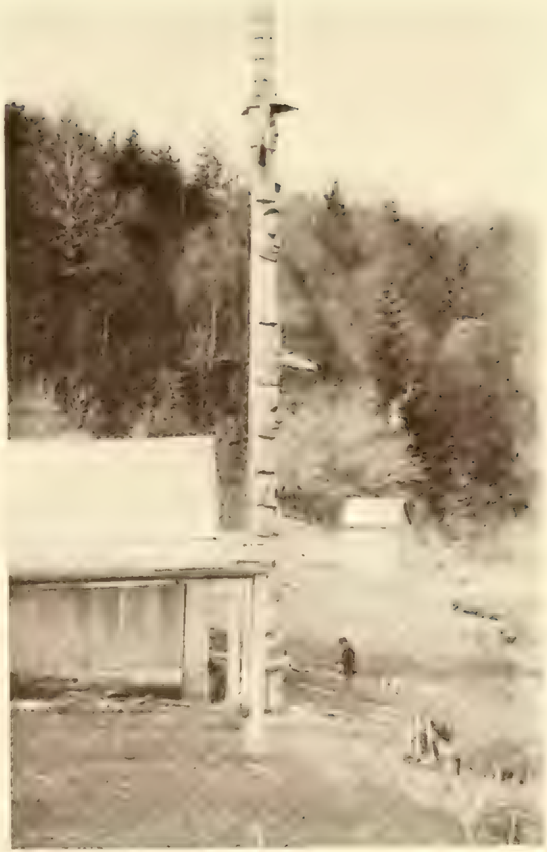

Fig. 6.

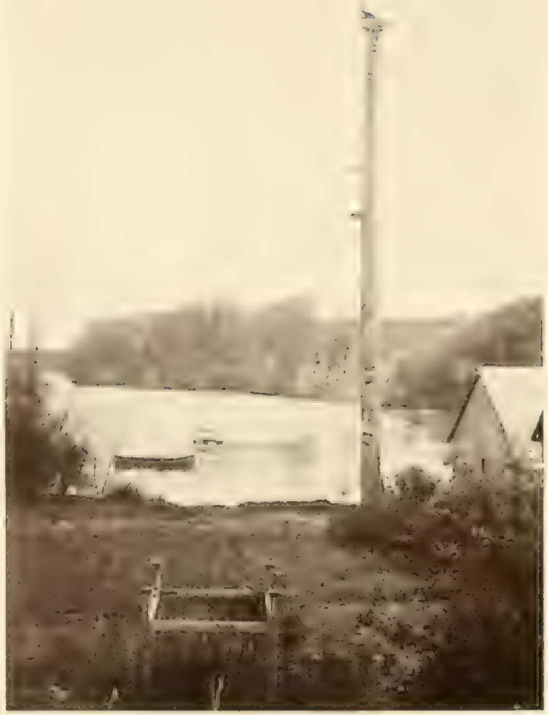

Fig. 5.

PLATE IV.

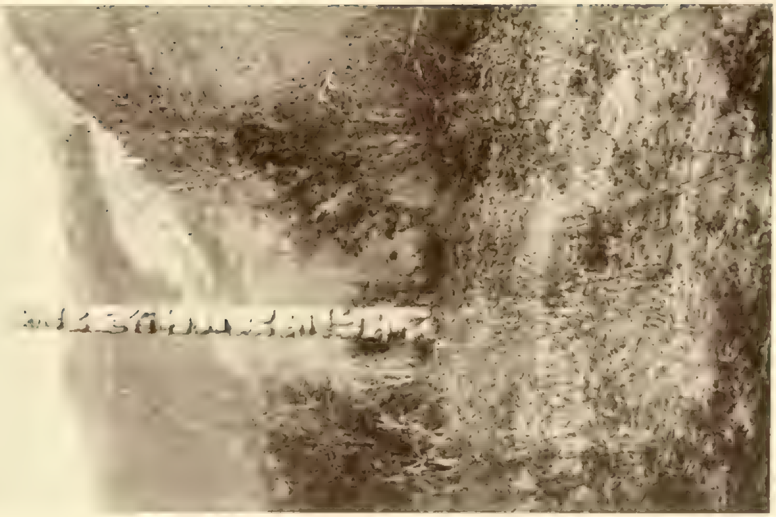

Fig. 7

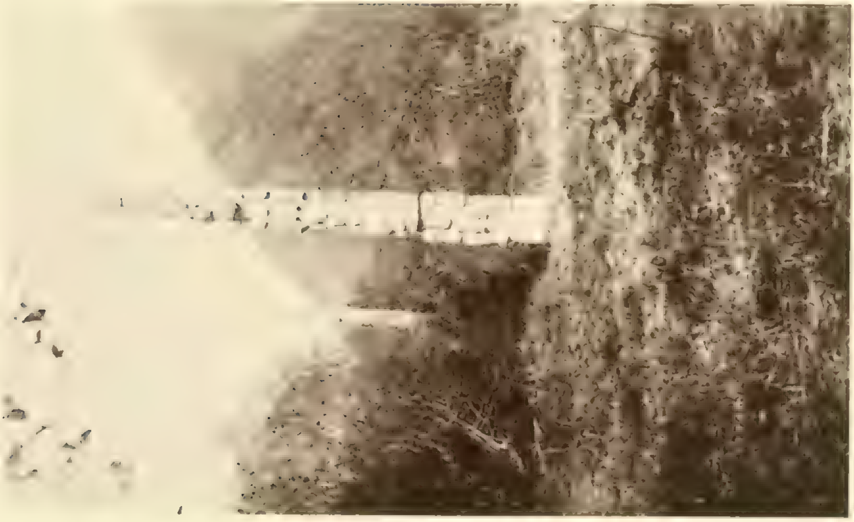

Fig. 8.

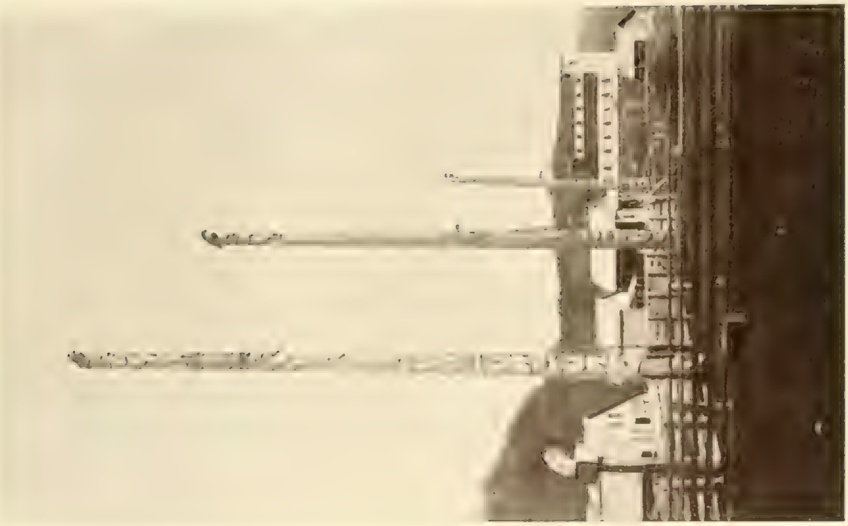

Fig. 9.

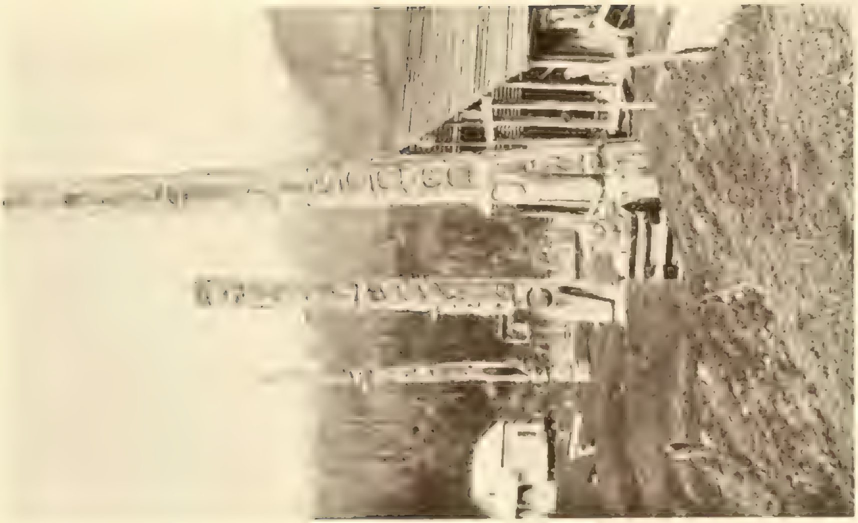

Fig. 10.

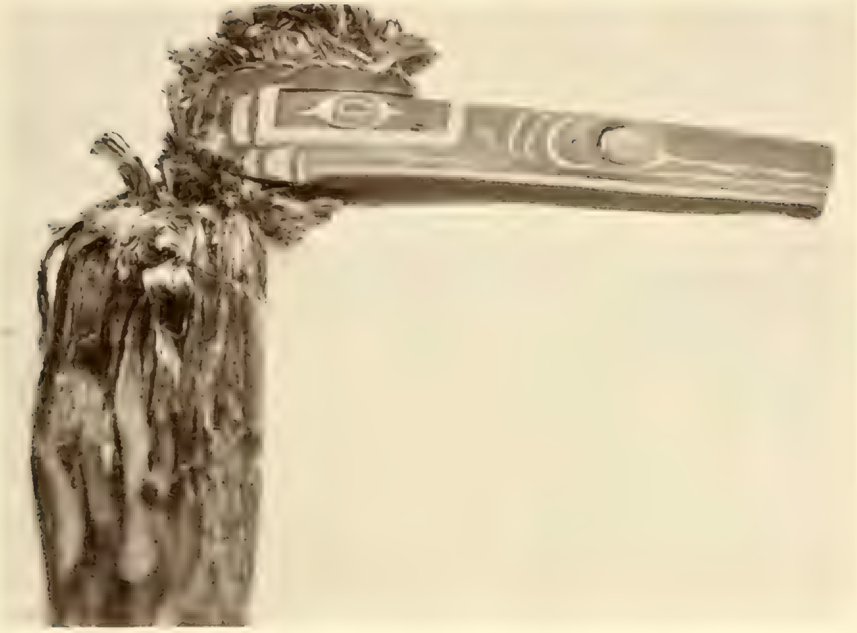

Fig. 11.

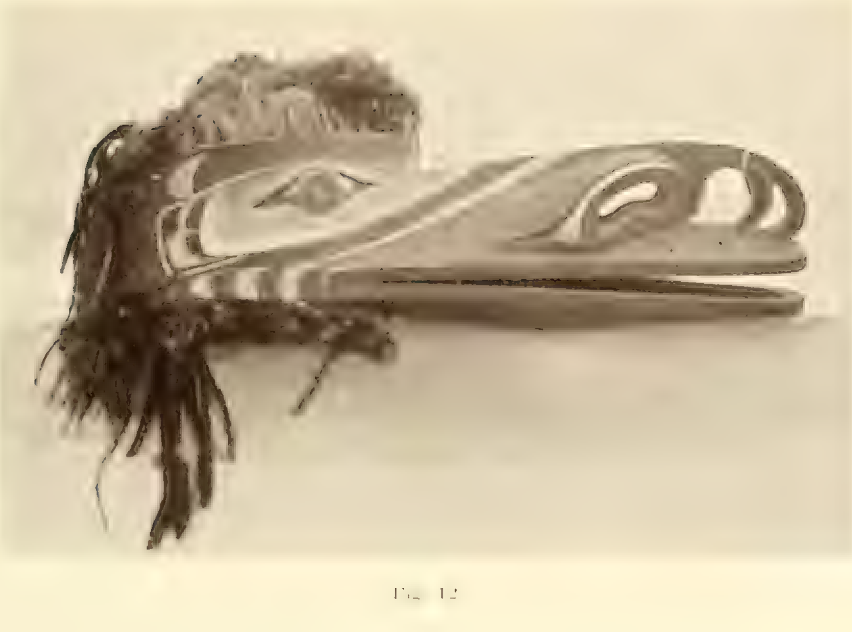

Fig. 12.

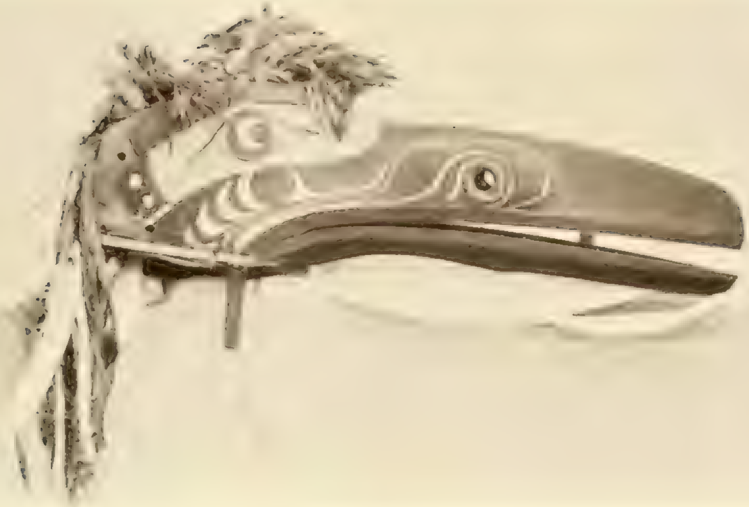

Fig. 13.

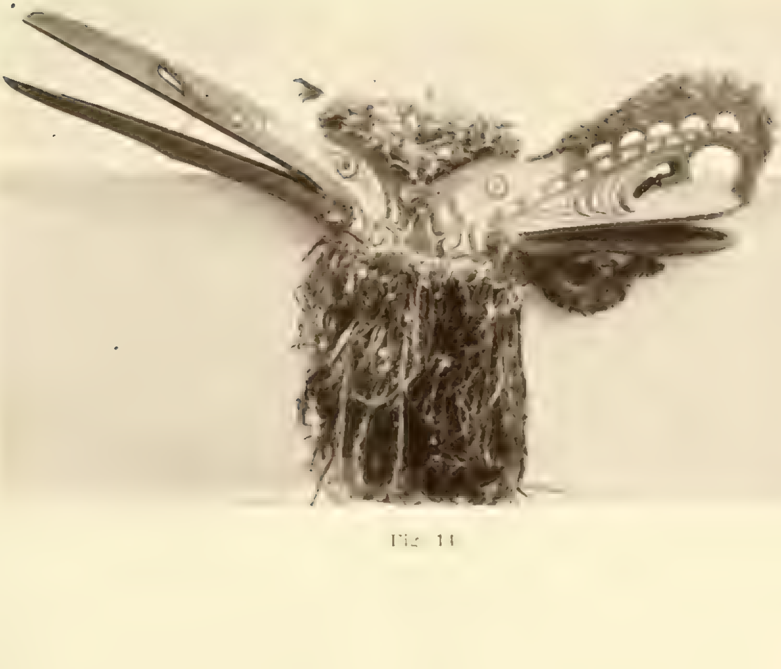

Fig. 14.

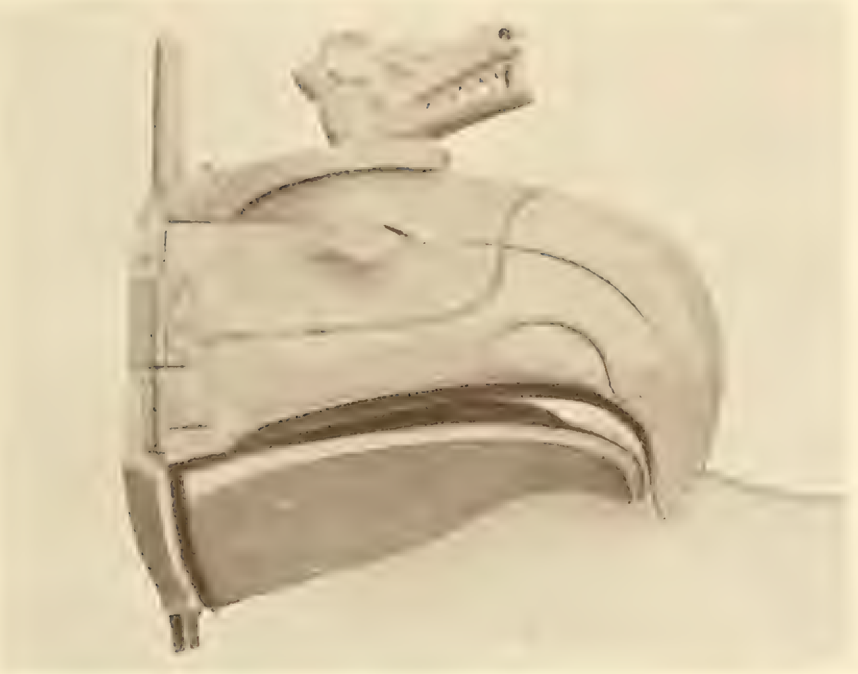

Fig. 15

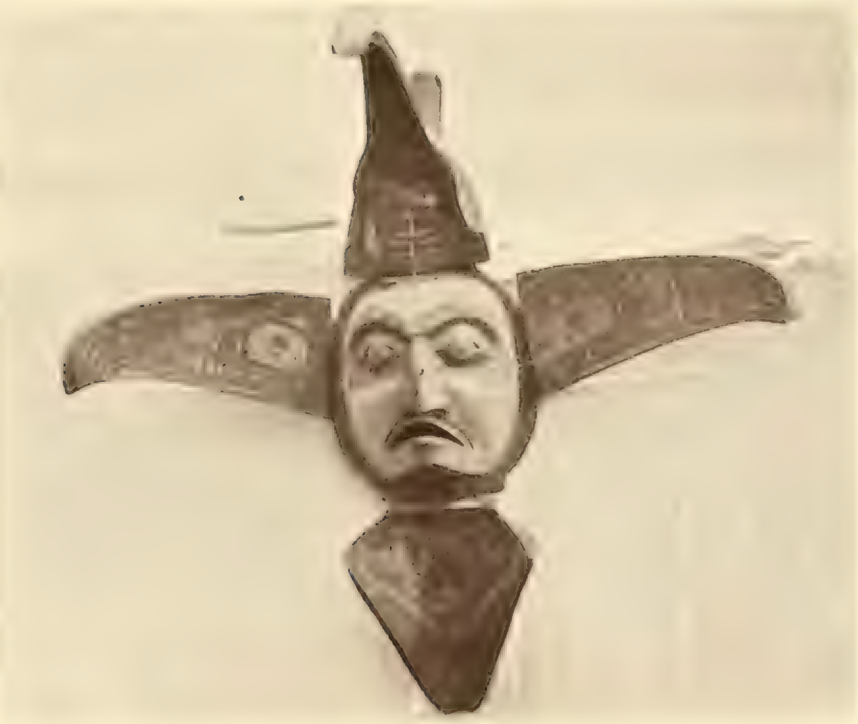

Fig. 16

PLATE IX.

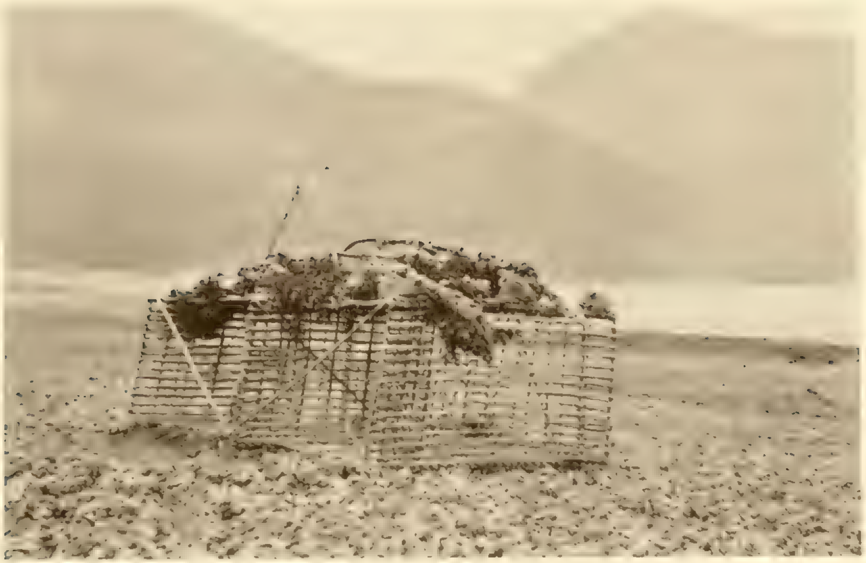

Fig. 17

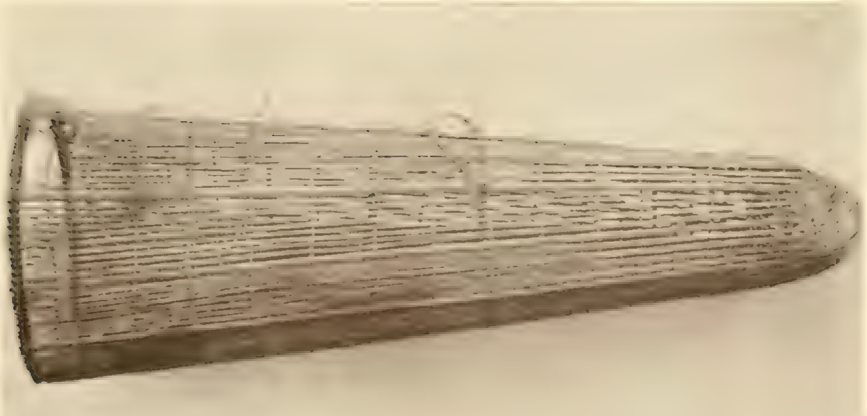

Fig. 18

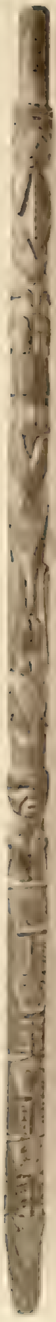
Fig. 19

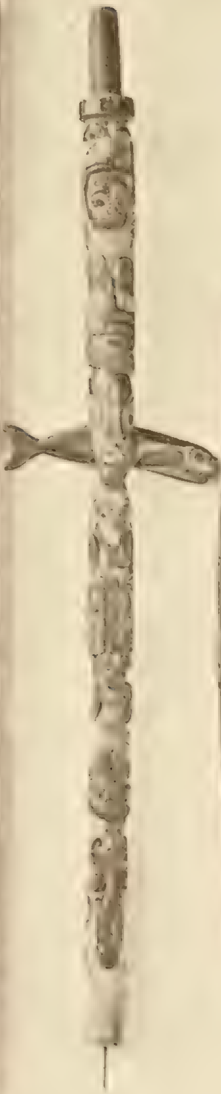
Fig. 22

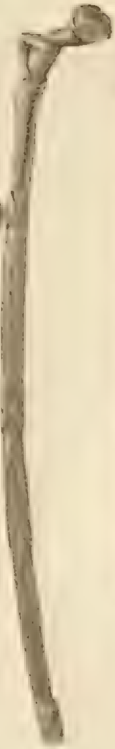
Fig. 21

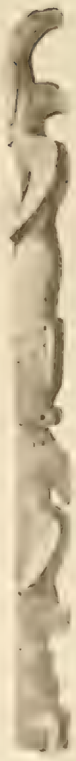
Fig. 20

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〃 71—Monograph of the Foraminifera of N. Pacific Ocean.
〃 83—Type Species of the Genera of Ichneumon Flies.
〃 84—Contribution to the Study of Ophiurans.
〃 86—Monograph of Genus Chordeiles swainson, New Fam. Goatsucker.
〃 87—Culture of Ancient Pueblos, New Mexico, Arizona, etc.
〃 73—Beaked Whales, F. W. True.
〃 74—West Indian Echinoids.
〃 85—Jumping Plant Lice.
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〃 2021, 〃 46—Extinct Bisons of North America.
〃 2023, 〃 46—Brackish Water Pliocene Fauna of S. Coastal Plain.
〃 2025, 〃 46—Camels of Fossil, g. Camelops.
〃 2028, 〃 46—Philippine Is. Land Mammals.
〃 2030, 〃 46—New sp. Crab, Family Grapsidæ and Ocypodidæ.
〃 2032, 〃 46—Rotatoria of Washington.
〃 2036, 〃 46—New American Pycnodont Fishes.
〃 2034, 〃 46—Bats g. Glossophaga.
〃 2038, 〃 46—Fossil Crinoid, g. Homocrinus.
〃 2044, 〃 47—New species Crab, Fam. Grapsidæ and Ocypodidæ.
〃 2047, 〃 47—New Genera and sp. American Srachryhynchous Crabs.
〃 2022, 〃 46—New Starfishes, Philippine Is.
〃 2053, 〃 47—New Freshwater Mussel, Brazil.
〃 2055, 〃 47—Littoral Marine Mollusks, Virginia.
〃 2057, 〃 47—Grasshopper Mice.
〃 2059, 〃 47—Peculiarity in Tail Feathers Giant Hornbill.
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〃 〃 36—American Harvest Mice, by A. H. Howell.
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〃 〃 4— 〃 S. W. Ontario.
〃 〃 5— 〃 Western Peninsula of Ontario and Manatoulin Island.
〃 〃 8, Pt. I.—Excursion, Toronto to Victoria and Return.
〃 〃 8, 〃 II.— 〃 〃 〃 〃
〃 〃 9—Excursion, Toronto to Victoria and Return.
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" 23—Islands of Straits of Georgia and Queen Charlotte.
" 25—Clay and Shale Deposits of Western Provinces.
" 26—Geology and Mineral Deposits of Tulameen District, B.C.
" 29E-Oil and Gas Prospects of New Brunswick.
" 31—Wheaton District, Y.T.
" 44—Clay and Shale Deposits, New Brunswick.
" 48—Ojibwa Myths, S.E. Ontario.
" 32—Portland Canal and Skeena Mining Divisions.
" 43—St. Hilaire Mts., Quebec.
" 45—Alaskan Esquimo.
" 52—Geological Notes, Alberta.
" 33—Gowganda Mining Division.
" 20E-Goldfields of N.S.
" 39—Kewagama Lake, Que.
" 40—Archæan Geology Rainy Lake.
" 41—Fern Ledges, St. John, N.B.
" 42—N.E. Algonkian Art.
" 54—Flowering Plants, etc., Quebec.
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" " 11, " 13—Feathers of Circus hudsonicus.
" " 11, " 14—Western Meadow Lark.
" " 11, " 15—Anetides lugubris.
" " 12, " 4—Mammals and Birds of Colorado Valley.
" " 12, " 5, 6—New Mountain Beaver of N. California, etc.
" " 12, " 7—Microdipodops from California.
" " 12, " 8—River Otters of California.
" " 12, " 9—Pocket-gophers of California.
" " 12, " 10—Bats of California.
" " 13, " 1—Schizopoda, San Diego Region.
" " 13, " 2—Ctenophora, San Diego Region.
" " 13, " 3—Self-regulating Parraffin Bath.
" " 13, " 4—Diplodinium ecaudatum.
" " 13, " 5—Sehizopoda of San Diego Region.
" " 13, " 6—Heterodontus francisci.
" " 13, " 7—Melanophores of Frog.
" " 13, " 8, 9—New Syllidæ, San Francisco Bay.
" " 13, " 10—Medusan, g. Stomolphus, San Diego.
" " 14, " 1—Physical Conditions of San Francisco Bay.
" " 11, " 7, 8—Pigment Cells from Larvæ of Amphibians, etc.

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" 174, Zoological Series, Vol. X., No. 10—Fresh-water fishes of Costa Rica.
" 175, " " " X., " 11—New Mammals, Venezuela.
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" " XXXIII., " XIV.—Two New Mammals, Ecuador.
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" " XXXIII., " XIII.—New g. Birds from Venezuela.
" " XXXIII., " XXVI.—Mammals from East Africa.
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" " XXXIII., " XXV.—New South American Bats, etc.
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" 187—Feeding experiments with Lambs.
" 188—Ration Experiments with Swine.
" 190—Brome Grass
" 191—Alfalfa Seed Production.
" 192—Cider Vinegar.
" 193—Colorado Soils.
" 194—Artificial Waterways.
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" " 3—Graphic Art, Middle Europe.
" " 4—Geo. Innes and Alex. H. Wyant.
" " 5—Gardner Symons.
" " 7—Charles W. Stetson.
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" " 10—Elizabeth Wentworth Roberts.
" " 11—9th Annual Exhib. American Art.
" " 13— " " "
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" " 16—19 An. Exhib. Society of Western Artists.
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" " X., " 4 : Butterflies, etc.
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" " " XII., " 69.
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VICTORIA, B.C.:
Printed by William H. Cullin, Printer to the King's Most Excellent Majesty.
1915.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1915.

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by William H. Cullin, Printer to the King's Most Excellent Majesty.
1916.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1915.

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1916.

To His Honour FRANK STILLMAN BARNARD,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Provincial Museum of Natural History for the year 1915.

THOMAS TAYLOR,
Provincial Secretary.

Provincial Secretary's Office,
March 17th, 1916.

PROVINCIAL MUSEUM OF NATURAL HISTORY,
VICTORIA, B.C., March 17th, 1916.

The Honourable Thomas Taylor,
Provincial Secretary, Victoria, B.C.

SIR,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1915, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,
FRANCIS KERMODE,
Director.

PLATE I

John Cochrane, Sir Richard McBride, K.C.M.G., A. A. Freeman, Colonel Theodore Roosevelt, Hon. D. M. Eberts, K.C., and F. Kermode

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1915.

Since the Report of 1914 considerable progress has been made in the gathering of specimens of natural history of the Province. Most of these specimens, like the material that has been secured in recent years, will have to be placed in storage, as it is impossible now to place any more material on exhibition owing to the fact that the collection has outgrown the present building. The subjects which are best represented and which have been as a whole most completely classified, and can therefore be most advantageously exhibited for the benefit of the public, are, namely: Anthropology, mammalogy, ornithology, oology, ichthyology, entomology, and botany. In the several branches of these subjects the collections are already important and extensive, including a number of type specimens, and arrangements are under way for valuable additions. While it is a primary duty of the Museum to preserve and exhibit specimens confided to its care, the importance of the collection does not rest there, nor upon the number of specimens assembled and their value in currency, but upon the use to which they are put. From an educational point of view the collections are of great value to those persons who are interested in studying the natural history of this Province. The specimens in the exhibition halls have been carefully labelled, and there is also a large study series in the several branches in the annex at the rear of the Museum Building. These study series are available, on application to the Director, to those persons who wish to consult them. This annex is only a frame building and not fire proof, therefore every precaution is taken to ensure its safety, as it contains many valuable specimens that it would be impossible to replace, especially in the branch of anthropology. It also contains a large study series of bird skins for which moth-proof drawer-cases were made during the summer. During the early part of the year the botanical collection which has been in the Department of Agriculture was transferred to the Museum, as it was thought that this collection would be more accessible to the general public for study were it placed in conjunction with the Museum collection which was started in the year 1898, and which has been greatly added to by the Department collectors in the last few years.

A great deal of attention was given during the past year to the proper labelling of specimens and the sorting of collections preparatory for storage. This work was principally carried on after the close of the collecting season and entails considerable work. A number of specimens in the several branches of natural history have to be sent to authorities on the different subjects to be identified and verified. This work is done gratis for the Province by larger institutions principally in the United States, who have a large staff of scientists with whom the Director keeps in touch. The collections of the Provincial Museum are developing so much that before long our scientific staff will have to be increased by having custodians in charge of some of the most important branches of natural history, more particularly if the Museum is to be expected to carry on educational work. A great deal more interest is being taken in the flora and the fauna of the Province by school-teachers, especially during the session of the summer school which is held in Victoria. The Museum is always ready to assist visiting teachers in any way possible, and from remarks that have been expressed, this seems to be thoroughly appreciated. It is gratifying to see that the number of teachers who bring their scholars to visit the Museum for nature-study is increasing, also the interest taken by the children, some coming from the surrounding districts near Victoria.

A larger number of persons visited the Museum this year than during the past year. This, no doubt, was due to the Panama-Pacific Exposition being held in San Francisco, California. Had it not been for the terrible European war at present in progress, no doubt the number of visitors would have been nearly doubled. One of the most notable visitors to the Museum this year was Colonel Theodore Roosevelt, who passed through Victoria on Sunday, July 18th, and visited the Museum accompanied by the Premier, Sir Richard McBride, K.C.M.G., the Honourable Thomas Taylor, and the Honourable D. M. Eberts, Speaker of the Legislative Assembly. The party was shown over the exhibits by the Director, and many complimentary remarks were made by Colonel Roosevelt, which were greatly appreciated.

The Provincial Museum wishes to extend grateful thanks to the following gentlemen who have greatly assisted with identifications in their respective branches of biology:—

Identification of Birds and Mammals.—The Biological Survey, United States National Museum, Smithsonian Institution, Washington, D.C., and personally the following scientists: Messrs. H. W. Henshaw, Chief of the Biological Survey; E. W. Nelson, Assistant Biologist, Vernon Bailey, E. A. Preble, A. H. Howell, and Jackson; also Mr. H. C. Oberholser, who kindly identified a large series of bird-skins.

Identification of Entomological Specimens.—The Biological Survey, United States National Museum, Smithsonian Institution, Washington, D.C., and personally the following: Messrs. C. H. Townsend. Curator of Entomology, J. C. Crawford, R. P. Currie, Nathan Banks, Knab, S. A. Rohwer, and E. A. Schwarz; also Doctors Barnes and McDunnough, of Decatur, Ill.; Professor Raymond C. Osburn, of Columbia University; Mr. F. H. Wolley Dod, of Calgary, Alberta; Mr. L. W. Swett, Boston, Mass.; and Mr. E. H. Blackmore, Victoria, B.C.

Thanks are due also to Professor John Macoun, Naturalist of the Geological Survey, Ottawa; Mr. J. M. Macoun, Curator of the Herbarium, Ottawa; Mr. Lawrence M. Lambe, Vertebrate Palæontologist, Ottawa, and C. F. Newcombe, M.D., Victoria.

Notes on bird migrations and observations have been received from the following: J. E. H. Kelso, M. D., and W. B. Johnson, Lower Arrow Lakes; A. H. Palmer, New Westminster; W. R. Carter, Deputy Game Warden, Alberni; Rev. A. C. Mackie, Vernon; J. A. Munro, Okanagan Landing; and W. A. Newcombe.

The Museum has been pleased to loan specimens and data in the different branches to authorities in the larger institutions throughout the East for the purpose of assisting specialists in their work of monographing several species of mammal and bird life. Ornithological specimens have been loaned to Mr. P. A. Taverner, Ottawa, and to Mr. J. H. Fleming, Toronto; also to the Biological Survey and Smithsonian Institute, Washington, birds and mammals; and a large collection of grizzly bear skulls to Dr. C. Hart Merriam for study and comparison, to assist him with his work on the "Grizzly Bears of North America," to be published under the Harriman Alaska Series of the Smithsonian Institution.

EXPLORATION.

During the year the Director arranged for three men to engage in field-work during the summer in widely separated districts, so as to cover as much territory as possible, and also to make the appropriation which is made by Legislature for this purpose go as far as possible, get results, and yet practise the strictest economy, which is necessary in the administration of this Department at the present time. These men were instructed to collect specimens in all branches of biology and in botany. Their respective reports show that they were successful, and I think the Museum has been more greatly benefited by this arrangement than by sending all the collectors out in one party.

Mr. E. M. Anderson, of the Museum staff, was stationed at Sahtlam, about eleven miles from Duncan, Vancouver Island, for the months of May, June, and July, and reports as follows:—

"Camp was established from May 8th to July 29th in an old log cabin built on a side-hill close to the Cowichan River and situated midway between the town of Duncan and Cowichan Lake. The latter is noted as a splendid fishing and hunting resort. The lake, being easily reached both by railway and stage, induces many sportsmen to spend a few days' sport during the open season; this fact also applies to the Cowichan River at certain times of the year. Sahtlam Valley varies from two to six miles in width, with thickly timbered mountains (chiefly Douglas fir with considerable cedar along its base), ranging from 2,000 to 3,000 feet above sea-level, whose general trend is to the north-west, forming a continuous chain the whole length of the Island, with a gradual decline at both ends; the highest snow-clad peaks attain an altitude of over 7,000 feet. The bottom lands, through which the Cowichan River flows, are mostly covered with willow, cottonwood, alder, fir, and cedar. Clearings and roads intercept many parts, which otherwise would have been difficult to collect in. Regarding weather conditions, considerable rain fell during May and the first week of June, after which the weather became more settled. From July 1st to the 6th it became very hot, the thermometer registering 86 degrees in the shade; however, the heat soon modified and most delightful weather was encountered until my departure from the district on July 29th. Most of my time afield was devoted chiefly to the collecting and preserving of birds and mammals, therefore allowing but few hours daily for the collecting of botanical and entomological specimens and a few fishes, reptiles, and batrachians. The total number of specimens, including duplicates, are as follows: Mammals, 53; birds, 209; nests and eggs, 11; plants, 35 species; insects, 1,382; fishes, 17; reptiles, 29; batrachians, 11."

Mr. J. A. Munro, who collected in the Okanagan District, carried on excellent field-work, and reports as follows:—

"The field-work extended from May 1st to August 31st. With the exception of a week spent near Nahun, on the west side of Okanagan Lake, work was confined to a small area in the vicinity of Okanagan Landing. Okanagan Lake is at an altitude of 1,140 feet, and at this point is enclosed between low mountains. The timbered portions close to the lake are open and park-like, with yellow pine (*Pinus ponderosa*) predominating. Towards the summits the growth of timber is heavier, with Douglas fir (*Pseudotsuga taxifolia*) in the majority. Deciduous trees, principally quaking-aspen (*Populus tremuloides*), western birch (*Betula occidentalis*), black haw (*Crataegus douglasii*), bitter cherry (*Prunus emarginata*), etc., are confined to the creek-bottoms and to certain well-defined draws in the mountain-side. On both sides of the lake are large areas of open range land, with many alkaline lakes and sloughs, most of them surrounded by a heavy growth of deciduous trees. This section proved a very productive collecting-ground. The muddy shores of the lakes were frequented by numbers of migrating waders, and several species of ducks were found breeding, notably Barrow's golden-eye (*Clangula islandica*) and buffle-head (*Charitonetta albeola*). During the past fifteen years the greater part of the arable land has been brought under cultivation, and with the protection and the increased food-supply afforded, there has been a marked increase in the number of summer birds. This is somewhat offset by the lessening numbers of breeding water-fowl following the drainage of the sloughs and marshes. The district described lies entirely in the Transition Zone and can be taken as typical of the Okanagan country. The months of May and June and early part of July were unusually wet for this region, there being weeks of almost constant rain, which interfered with field-work to some extent. Birds were shy and inactive and many transient species were late in arriving. This period of wet weather was followed by six weeks of dry heat that parched the vegetation on the hills and dried up many of the small lakes and sloughs. The week from June 7th to 14th was spent near Nahun, on the west side of Okanagan Lake, eighteen miles south of Okanagan Landing. Here a settler's cabin was rented, on a wide flat 2,000 feet above the lake, at an approximate altitude of 3,200 feet. This district lies in the Canadian Zone, as characterized by the dense growth of lodge-pole pine (*Pinus murrayana*) and western larch (*Larix occidentalis*). Englemann's spruce (*Picea engelmanni*) and balsam fir (*Abies lasiocarpa*) occur in isolated clumps. Such typical Canadian forms as olive-sided flycatcher (*Nuttallornis borealis*) and Columbian chickadee (*Penthestes hudsonius columbianus*) were noted. In some places the line between the Transition and Canadian Zones is very sharply defined, the yellow pine and Douglas fir ending abruptly at the summit, to be succeeded on the level top by lodge-pole pine and western larch. The creek-bottoms are heavily wooded with quaking-aspen (*Populus tremuloides*) and mountain-birch (*Betula fontinalis*), both of which grow to great size. Following is a summary of the material collected during the four months of field-work: 471 birds, representing 130 species; 21 sets of eggs; 126 mammals; 1,900 insects; 17 batrachians; 9 reptiles; 40 fishes; and 430 plants. Particular attention was paid to the collecting of moulting birds and juvenals in their various plumages, much of this material being new to the Museum collection."

Mr. C. B. Garrett collected in East Kootenay District, in the vicinity of Cranbrook, and reports as follows:—

"Field-work was started on May 5th in the district surrounding Cranbrook, which is situated about the centre of the East and West Kootenays, but at the more southerly end. The district is hilly or mountainous and runs from 2,900 to 9,600 feet in altitude. Land is not at all highly cultivated, except in very small areas, and is chiefly covered with coniferous trees. Occasionally one runs across small patches of poplars which are found chiefly in the river and creek-bottoms, accompanied by willow and other smaller shrubs. Creeks are numerous from the mountain-slopes, and numbers of sloughs and small open lakes occur throughout the district. Owing to the fact that the land is uncultivated and therefore offers no special attraction to them, the birds occur in very small numbers to a species, although the number of species is fully up to the average of other districts. From a collector's standpoint the weather was most disappointing, for out of the ninety-two days (collecting was carried on from May 5th to the end of July) it rained on forty-eight days. Material collected is as follows: Birds, 291 specimens, covering 81 varieties; mammals, 107 specimens, representing 16 species; 43 sets of eggs; 1,627 insects of various orders; also a collection of botanical specimens."

(NOTE.—It is proposed by the Director, at some future date, to publish separate pamphlets on the birds and mammals collected in these several districts.)

ANTHROPOLOGY.

Very little has been done in the way of collecting anthropological material during the past year, owing to the fact that no appropriation was made for expenditure in this department of the Museum. However, a few minor purchases were made, which, with a number of small donations, have increased the collection to a certain extent. Following is a short description of the several objects added to the anthropological collection:—

Salishan.

Cylindrical stone, pointed at both ends (? whetstone), Dallas Road, Victoria. Presented by Arthur Warren.

Perforated anchor-stone, Dallas Road, Victoria. Presented by Sir John Jackson Co., Ltd., per A. L. Elgee, C.E.

Perforated stone sinker, torpedo-shaped (? for salmon-trolling), Brentwood Bay, V.I. Presented by A. Shotbolt.

Dene.

Packing-basket, edged with quills. Purchased from F. D. Marriott.

Kwakiutl.

Skull, sugar-loaf shaped, from the beach, Cape Scott, V.I. Presented by C. J. Wilson.

Stone adze or slave-killer and child's toy of cedar-bark matting, Quatsino. Purchased from Jum Killchait.

Haida.

Carved stone maul of white quartzite, Graham Island, Q.C.I. Presented by Pte. G. S. Mayer, 48th Battalion, C.E.F.

Carved slate totem-poles (7) and carved slate dish. Purchased from D. Cochrane, Q.C.I. (NOTE.—Stories accompanying these slate carvings are appended to this list.)

Tsimshian.

Lynx-head mask, Metlakatla. Purchased from C. C. Perry.

Kootenaian.

Sling pouch, fringed, embroidered in beads in front, two-arrows design, blue on white ground.
Pair of moccasins, top beaded, native design.
Basket.
Pouch, front all beaded, two-hands design.
Large abalone, perforated.
Nez Perce bag.
Wampum necklace, white and green.
Head-scratcher.
Fish-hook.
Stone pipe.
Two eye-teeth of ? on skin string.
The above Kootenaian specimens purchased from Mrs. J. Gill.

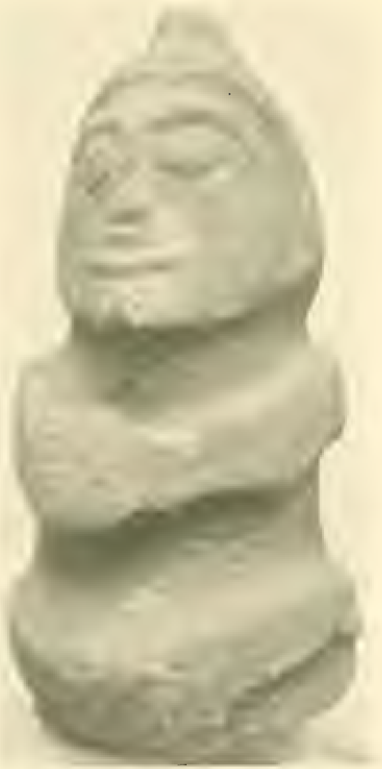


Fig. 1 Carved [illegible] Hon. M. [illegible] Museum [illegible] No. [illegible]

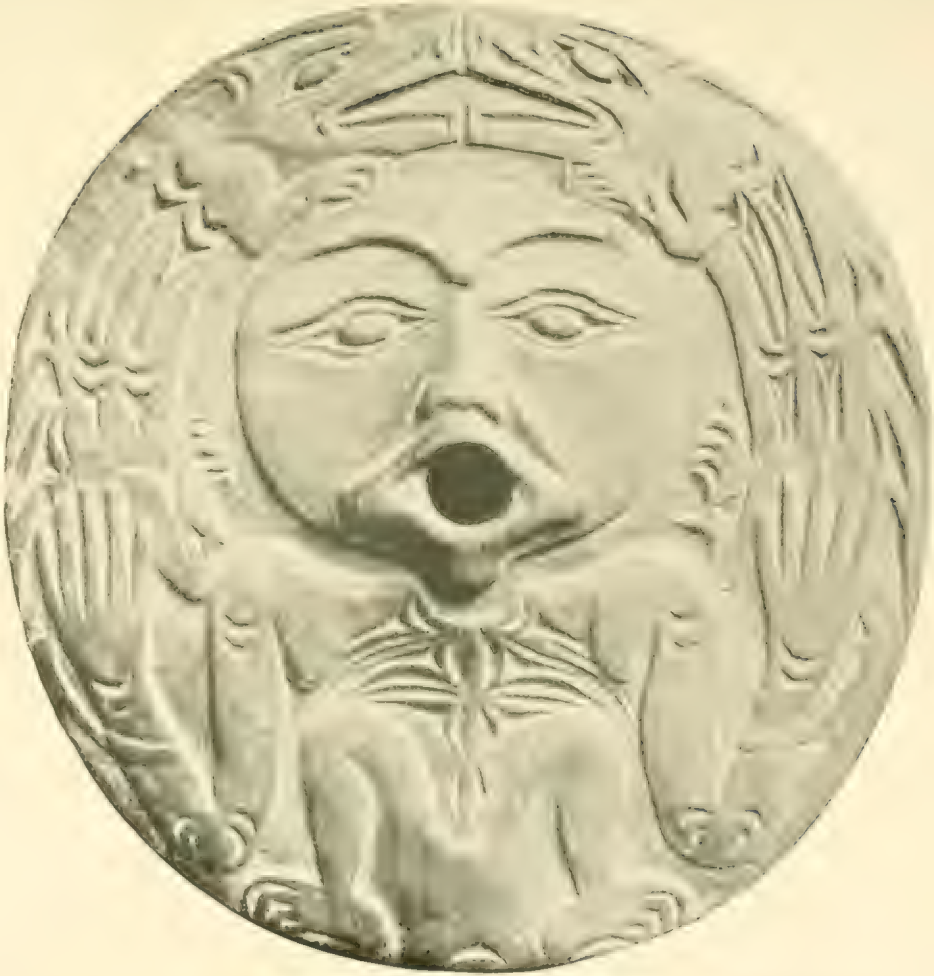


Fig. 2 Spindle whorl of maple, convex surface, 9½ inches diameter. Collected 1908, Beecher Bay (Salishan, Coast). Catalogue No. 1179

Stories accompanying Slate Totem-poles from Queen Charlotte Islands.

No. 2866. Nahnasimgh was a mighty warrior; one day when his wife was on the beach, the King of the Whales saw her and carried her off. Nahnasimgh followed them to the whale country, where he succeeded in rescuing her, but was hotly pursued by the whales. The fugitives ran until they met the Giant Mud Crane, who hid them in his breast feathers. When the whales came to the crane they asked him if he had seen any one, and he said that he had not. So the whales went another way and Nahnasimgh and his wife went home and lived happily ever after. Moral: It is quite right to tell lies when your friends are in trouble. (Pole No. 2866 shows the Crane, Nahnasimgh, his wife, with the lip jewel and bracelets of a lady of quality, and the Whale.)

No. 2867. Shows the wife of Nahnasimgh being carried off, holding the whale's back fin.

No. 2868. The Beaver's Lake. Once upon a time all the fish belonged to the Beaver, who kept them in a lake behind his house. The Raven (who made the world out of what he could steal and became the ancestor of the Haida Indians) wanted the fish, so one day he dressed up as a poor man, met the beaver one evening, and asked for a night's lodging. The Beaver had just come home from a gambling-feast, and was feeling pretty good, so he took him in. After supper the Beaver went to sleep and the Raven stole out of the back door, picked up the lake in his beak and flew off with it. He gave it to the Indians. Moral: It is quite right to steal for your friends. (No. 2868 shows the Raven dressed as a poor man, then the Raven carrying the lake with the fishes in it, and the Beaver.)

No. 2869. The Bear saw the above, and told it. The Beaver had to take to chewing a stick for a living, and has done so ever since. The face on the tail seems to indicate that the Beaver had human intelligence at that time.

No. 2870. The Raven and the Fisherman. The Raven when he was hungry used to dive down under the water and steal the bait off the Fisherman's hook. Once he got the hook caught in his beak, and the Fisherman, thinking he had caught a fish, pulled in the line so hard that the Raven's beak broke off. The Fisherman was much astonished to find the Raven's beak on his hook. As for the Raven, he had to go with his face hidden until his beak grew again. Moral: The best of us get into trouble sometimes.

No. 2871. Illustrates the story of the Raven's Midnight Feast. The Raven was visiting some Indians. In the night when all were asleep, except a half-human-half-whale creature who saw and told the story, he stole out and soon came back with something under his wing. He scraped the fire aside and dropped his burden in the hot ashes. When it went off with a "pop" he ate it. Then he went out again and did the same thing. This happened many times. In the morning it was found that all the other inhabitants of the village had lost one eye each. Moral: Feed your guests well so that they won't get hungry in the night.

No. 2872. The Raven in Disguise. One time the Raven disguised himself as a woman, and came to live with the Indians. After living with them for some time they saw him eating fish on the beach, so they recognized him and he flew away. (No. 2872 identifies the Raven as the great one, by showing his partner, the Eagle, who could eat a whale.)

No. 2873. Kholqu'haludi. Kholqu'haludi was a little boy who was always late for his meals. One day he came in too late for dinner and his mother would give him nothing but a piece of dried salmon. He went down to the beach to eat it, and dipped it into the water to soften it. The King of the Salmon saw him and carried him off and turned him into a salmon. The next year when the salmon began to run, Kholqu'haludi's father caught a fine big fish in the stream and took it home to eat. When he started to cut its head off, just inside the skin his knife struck copper. He remembered that the boy had worn a copper ring around his neck, so he took the salmon outside and laid it on the ground under the drip of the roof. As the water fell on it the salmon skin sloughed off, revealing Kholqu'haludi inside. The boy grew up to be a great medicine man, but he always had a sore neck where his father had started to cut the salmon's head off. (This plate shows Kholqu'haludi emerging from the salmon skin, holding in his hand the short wand used by Haida medicine men.)

MAMMALS.

The collection of mammals on the first floor is now so crowded that it is impossible to adequately display them. It has been the intention to carry on the work started several years ago, in grouping the different species and displaying them with painted backgrounds illustrating the natural surroundings which they inhabit, but this has been postponed indefinitely until more space is acquired, as it takes considerable space to do this class of work. The Department already has in storage a large number of mammals for this work, namely: Moose (*Alce americanus*), three species of caribou (*Rangifer montanus*, *osborni*, and *dawsoni*), mule-deer (*Odocoileus hemionus*), white-tail deer (*Odocoileus virgultus*), panthers (*Felis oregonensis*), wild-cats (*Lynx fasciatus*), grizzly bear (*Ursus horribilis*), gray wolves (*Canis occidentalis*), sea-lions (*Eumetopias stelleri*), and many others. The Department was also successful in securing another specimen of the white bear (*Ursus kermodei*), a male in perfect fall pelage, killed on Gribble Island in L. 53, 129 W.L. A large collection of small mammals is being studied at present, and a number of specimens representing many species are being prepared for exhibition. This latter branch has not been very well represented until recently; it is difficult with a small staff to pay particular attention to all branches of museum-work, and the public does not take as keen an interest in small mammals as in the display of big game.

The Director had a very fine collection of heads of the big game of the Province mounted for exhibition in the offices of the Agent-General in the British Columbia Building, Regent Street, London, England.

INVESTIGATION OF REPORTED DISEASE IN THE BLACK-TAIL OR COLUMBIAN COAST DEER (*Odocoileus columbianus*).

For a number of years the deer of Texada Island have been reported by settlers and others in the vicinity of Vananda to be infested with some disease. The Director, accompanied by Drs. S. A. K. White and Ansen Knight, Veterinary Surgeons of the Live Stock Branch, Department of Agriculture, undertook to carry on an investigation in regard to this reported disease. In November, 1915, a trip was taken to Vananda, Texada Island, were three deer were secured for examination. Upon being dissected, two of these animals were found to be in a healthy condition; in the third, however, the liver was found to be badly affected by a fluke-worm. Settlers of this Island report that about every third deer is affected in this manner with what they term "hard or black livers." This term comes, of course, from the black fluid that is found in the parts affected by the fluke. They also advise that numbers of deer are killed and never taken from the bush, being considered unfit for food. Later, on November 22nd, the Director received from Mr. W. A. Embleton, of Vananda, another liver which was in a very bad condition; this was taken from a smaller deer than the one which we had dissected while there. This liver was forwarded to Dr. S. H. Hadwen, D.V.Sc., Dominion Pathologist at Agassiz, for examination. Dr. Hadwen reported on December 2nd that he had taken from this liver eighteen large flukes which he identified as *Fasciola magna*, two of which he sent to Dr. Ransom, of Washington, for further determination. This appears to be the first actual record of this parasite having been discovered in the Coast deer; the particular fluke being known in sheep raised on the Fraser River as *Fasciola hepatica*. Later, in January, 1916, another trip was arranged to Texada for further knowledge regarding this fluke. Drs. White, Hadwen, and Mr. Whittaker, of the Museum, composed the party which was taken to the island by the launch "R. V. Skinner," kindly loaned for the occasion by the Forestry Department. On this trip only one deer was secured, and this was found to be in a healthy condition, with the exception of three tapeworms. (These resembled *Cestoidea tenuicollis*. Dr. Hadwen is having this verified.)

It is impossible at the present time, until further investigation is carried on, to make any suggestions as to how to get rid of these parasites.

DESTRUCTION OF SEA-LION (*Eumetopias stelleri*).

On April 8th, 1915, the attention of this Department was called to the fact that the Fisheries Department of the Federal Government at Ottawa had set aside the amount of $6,500 for bounties of $2 each to be paid on the lips of sea-lions killed along the Coast of British Columbia. The Director of this Department immediately took the matter up with the Honourable J. D. Hazen, Minister of Fisheries at Ottawa, asking that the payment of bounties for the killing of sea-lions on this Coast be suspended, and suggested that, as there was a diversity of opinion on this matter, a thorough investigation be made in regard to the life-history of this mammal by the Ottawa Fisheries Department, not only having fisheries experts on the Board, but other biologists. Later Mr. F. J. Desbarat, Deputy Minister of Naval Service at Ottawa, wrote that it had been arranged to have the Biological Board of Canada investigate

PLATE III

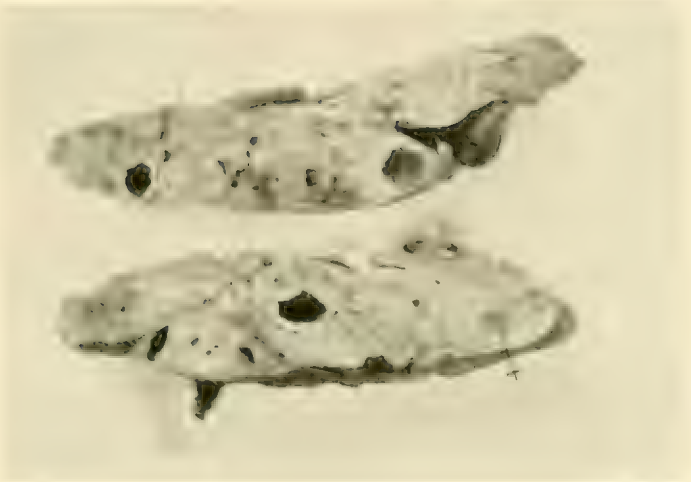


Fig. 1. Liver of Black-tail or Columbian Coast Deer (*Odocoileus columbianus*), showing the effect of liver-fluke (*Fasciola magna* Bassi). Note enlarged ducts, and fluke cut across at point "x."

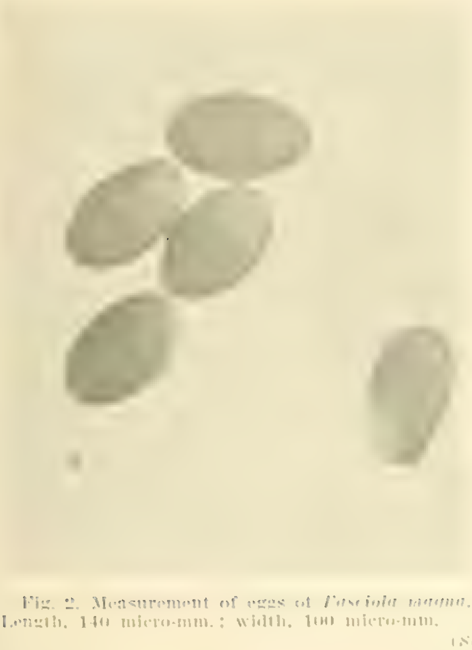


Fig. 2. Measurement of eggs of *Fasciola magna*. Length, 140 micro-mm.; width, 100 micro-mm.

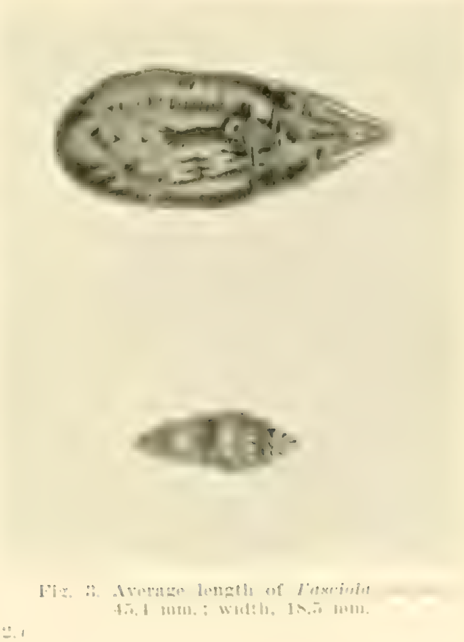


Fig. 3. Average length of *Fasciola* 45.4 mm.; width, 18.5 mm.

(*See* page 12.)

this matter during the summer, and that to this end a special committee had been formed. Dr. A. B. McCallum, who is Secretary of the Board, arrived in Victoria towards the end of July to make arrangements for a meeting of this special committee, which is composed of C. F. Newcombe, M.D., Chairman; Dr. McLean Fraser, of the Biological Station at Departure Bay; and W. Hamar Greenwood, Esq., of Vancouver, Secretary; to carry on investigations for the Biological Board throughout the summer. Until this special committee hands in a report of their findings it is impossible to say what will be done in the matter.

It will be seen by the following data received from Mr. F. H. Cunningham, Chief Inspector of Dominion Fisheries, New Westminster, dated August 10th, the amount of damage and the ruthless destruction that has been carried on at the sea-lion rookeries on the Coast:—

Bounties paid.

Year.	HAIR-SEALS.		Year.	SEA-LIONS.	
	No.	Amount.		No.	Amount.
1913	....	....	1913	....	....
1914	2,237	$7,829.50	1914	....	....
1915	750	750.00	1915	2,875	$5,750.00
Totals	2,978	$8,579.50	Totals	2,875	$5,750.00

Further information was received from Mr. J. A. Pauline at Bella Bella, to whom the Director wrote, having heard of certain persons in that vicinity killing large numbers for bounty. Quoting from Mr. Pauline's letter: "The largest lot we received here were shot by Jno. Wootten and Lorne Williams (the last man is an Indian), they shot three days and brought to Bella Bella over 1,600 noses, and killed easily half that amount to get on the islands, which were lost in deep sea and not recovered. Below is a list of those who worked seals and sea-lions this year:—

"*Sea lions.*—Killed outside of Price Island, on rocks, Indian of China Hat killed to show noses 123, and half the number sunk.

"*Hair seals.*—Bella Bella Indians were after hair seals, and killed for money about 639; number killed would be easily 1,000.

"J. Wootten and Indian shot at Queen Charlotte Sound, in the groups you name (Sea Otter Group, Pearl Rocks, and Watch Reef), and in three trips, costing $78 in launch got cheques as follows: $40, $684, $98, $2,348; total $3,170."

On making further inquiries, I find that one man presented a claim for 1,173 sea-lions from one rookery; of this number, 800 representing about 75 per cent. were pups probably not more than a few days old. The pups are born about the middle of June. There are only three main rookeries along the Coast, all north of Vancouver Island and south of the southern end of the Queen Charlotte Islands—namely, Cape St. James Group, Sea Otter Group, and the Cape Scott Islands. (*See* Report of Commissioner of Fisheries of British Columbia, 1913, page 131, "Sea-lions on the Coast of British Columbia," by Dr. C. F. and W. A. Newcombe.)

I am thoroughly convinced that placing a bounty of $2 per lip on each sea-lion taken will in a very short time rid our Coast of this life entirely, as they are mammals which do not migrate far north and south along the Coast, but are to be found on hauling-out and feeding grounds not far distant from the main rookeries. I know from personal experience, having visited some of these rookeries, that if a man or men go there with the intention of killing these mammals for bounties, that for every matured specimen they shoot and secure they will lose at least six, as the animals when shot fall off the rocks and disappear almost immediately beneath the surface of the water and seldom float. Further, they are easily frightened off the rocks and come within 30 or 40 yards of the boat, roaring constantly, and are an easy mark for an ordinary shot. Landings can be made on almost all of the rookeries in moderate weather and the poor puppies slaughtered indiscriminately. If it is found that the sea-lions do the damage which the canners say, it would be far better for their numbers to be kept down by the Government under Government supervision, so that there will be no unwarranted waste of life. True it is that at the present time they do not stand very high in commercial value, but there is a company in Vancouver which in the year 1914 undertook to go out to Pearl Rocks and Watch Reef, in the Sea Otter Group, about seven miles south-west of Cape Calvert, in Queen Charlotte Sound, with the object of starting a new industry on this Coast. It appears that this firm did not make a very great success of their venture on accouut of starting rather late in the year, and experiencing very heavy weather; but the leather made from the sea-lion skins has been pronounced by experts to be excellent glove material. It seems a pity to clear out these herds, which at some time, with a certain amount of protection and a little judgment, could possibly be made of great commercial value.

One further point in this matter I would like to mention is the fact that possibly the sea-lions of the Coast of British Columbia should really come under the jurisdiction of the Provincial Government, being not migratory in their habits, and being born and reared on the islands along our shores.

I might also state that this matter has been taken up by Mr. Madison Grant, Chairman of the New York Zoological Society, who happened to be visiting in Victoria last July, and made inquiries regarding a report in a New York press of the bounties paid on sea-lions along this Coast. Mr. Grant was surprised to hear of this being a fact, after the investigation which had been carried on some years ago by Professor L. D. Dyche, of the University of Kansas, under the Washington Biological Department, regarding the sea-lions of the California Coast. (*See* Report of the United States Fisheries Commission, 1902, part 28, page 111.) Mr. Grant also remarked that the matter of the Steller sea-lions would be taken up by the Zoological Society this winter.

Very little has been written with regard to the life-history of this mammal, and it is hoped that the investigation will be carried on until definite conclusions are formed.

BIRDS.

The bird collection displayed in the exhibition cases on the second floor of the Museum received attention during the early part of the year, being relabelled and brought up to date as nearly as possible, with the correct data on each label. A large number of specimens were added to fill in gaps in several of the families, particularly birds that had been collected in Atlin during the past two seasons, and which were new to the Museum collection. During the past collecting season Mr. E. M. Anderson, of the Museum staff, added 209 bird-skins, representing 76 species, collected on Vancouver Island; in the Okanagan District Mr. J. A. Munro collected 471 birds, representing 130 species; and in the East Kootenay, near Cranbrook, Mr. C. B. Garrett collected 291 birds, representing about 80 species. These skins have been added to the reserve series which is kept for study, and which is now a large representative collection of skins from all parts of the Province. This series shows the changes of moult in the different seasons, and also contains a large number of juvenals. The study collection represents a great deal of work, and considerable time has been spent in the systematic arrangement of the different families and species. Further work on the study collection will be done as soon as additional sectional storage cases are made. These cases are made of cedar throughout, with drawers and air-tight doors on the front, being moth- and dust-proof, and have been found very satisfactory and more economical as to space than the old cabinet drawers. The osteological series of sternum bones of birds has had to be taken from the exhibition cases and placed in storage, so as to provide space for the extension of the oological series, which seems to be more attractive to visitors, especially children, as many of the sets of eggs are exhibited in their nests, and therefore are instructing and educating both to young and old. This arrangement of the series of eggs was carried on in the early spring, the specimens being labelled, giving full data, number in set, incubation, material nest is composed of, locality, and date. This series now represents about 250 species.

BARE ISLAND BIRD RESERVE.—Following up the matter referred to in last year's report—namely, the obtaining of Bare Island (known as Indian Reserve No. 9, Saanich Tribe) to be kept as a permanent bird sanctuary for the preservation of bird-life on this Coast arbitration has as yet been impossible owing to financial reasons. However, the Department is glad to report that the Honourable H. E. Young, M.D., at that time Provincial Secretary, on June 9th arranged through Mr. Duncan C. Scott, Deputy Superintendent-General of Indian Affairs at Ottawa, giving the Provincial Museum authority to place a guard on the island in charge

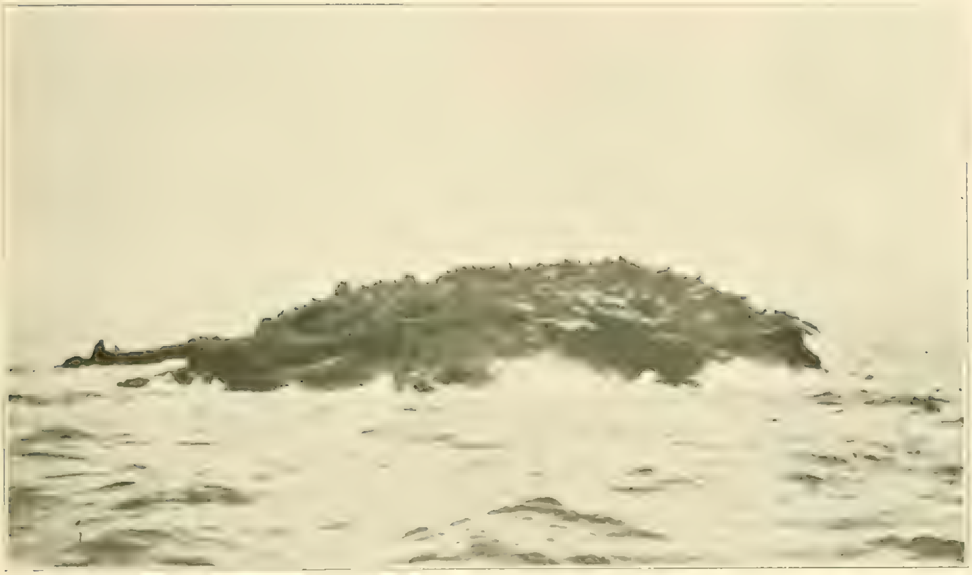


Fig. 1. Sea-lions on Pearl Rocks, south-west of Cape Calvert, Queen Charlotte Sound, B.C. June 21st, 1913.

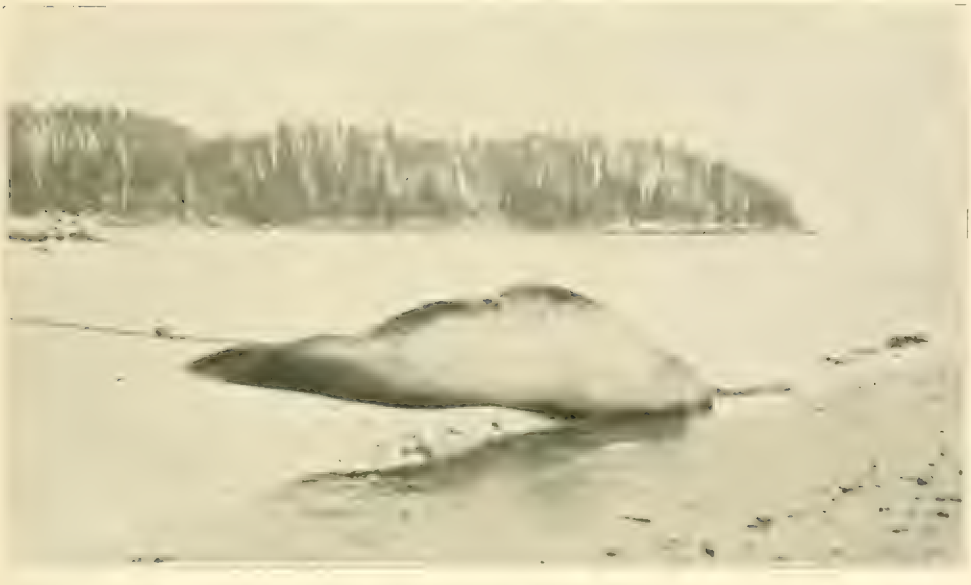


Fig. 2. Large Sea-lion killed on Pearl Rocks and towed to Grief Bay, back of Sorrow Island, June 21st, 1913. Approximate weight, 2,100 lb
(*See* page 14.)

of the bird-life during the nesting season. Mr. W. B. Anderson was appointed warden of the island, and while stationed there also made a small collection of marine life and botanical specimens. Mr. Anderson reports as follows:—

"In accordance with instructions, on June 15th I proceeded to Bare Island, in the Haro Strait, to act as warden and collector in the interests of the Museum.

"The glaucous-winged gull, the only species which breeds on this island, had commenced to lay a few days before the date of my arrival, as of perhaps fifty-eight nests noted on the 16th and 17th a few had three eggs—the maximum number—and a very few birds had begun to sit on the 17th. The total number of nests noted up to July 10th was 352. Upon this date I stopped counting these nests on account of there being so many sitting birds which would be disturbed at a critical stage of incubation. From the number of birds congregated on the island and outlying rocks, I estimate that not less than 450 bred this year on the island, a small number compared with what bred there twenty years ago, but still enough for nucleus of a large breeding stock if afforded adequate protection. The incubation period of these birds I have estimated to be about twenty-five days; the first-sitting bird's eggs marked on June 16th hatching on July 10th and 11th.

"The pigeon guillemot breeds on the island in fair numbers; I judge there were 200 nests there this year, as well as some on outlying rocks and on Halibut Island, Jones, Gooch, and other rocky islands adjacent. Though laying but two eggs, these are deposited in such cunningly concealed positions among the broken rocks and deep crevices, without any nest, that their extinction will be harder than in the case of the gulls, who make a big nest, plainly visible, in most exposed places. The incubating period of the guillemot is practically the same as that of the gull, the young being jet-black when hatched, the feet even lacking the brilliant scarlet colouring showing in the old of these interesting little birds. To make up for the lack of colour, however, the young are possessed of most pugnacious tempers, kicking, squealing, and biting very vigorously when drawn from their nests.

"Fifty cormorants, I judge, nest on the high cliffs on the west side of the island, laying from three to five eggs. These birds get quite used to a human being moving about near the nests, provided one goes quietly and without unduly exciting movements. The young, which emerge in twenty-six days, are shiny black when first hatched, apparently sparsely covered with black bristles. In this stage they are very reptilian in suggestion.

"During my stay on the island I noticed but three pair of puffins. These birds used to be plentiful, but shooting and other causes have brought about their almost entire disappearance from these islands. It is said that they breed in fair numbers on Skipjack Island, over the International Boundary from Bare Island.

"The birds here mentioned comprise the entire breeding sea-colony of the area. The rare black or Bachman's oyster-catcher, in former years plentiful, has disappeared. The little auklet, said at one time to have made this island its breeding-ground, has also deserted it for other parts. The causes for these diminutions and desertions is plainly evident: human beings—whites, Indians, and Japanese—carrying away the birds' eggs and young.

"As a gull, after laying a first set of eggs and having them taken, lays only two the second time, it follows that the stock of young is diminished; and when the second laying is removed it is probable that no more will be laid, or if by chance there are, the hatching will be so late that it is doubtful if the young will be strong enough to survive the rigours of the autumn. The practice of shooting on the grounds cannot be too strongly condemned. To say nothing of shooting during nesting season, winter shooting should also be rigidly prohibited.

"During the autumn and winter months, even into late spring, the Canada goose and laughing goose frequent the rocky Gulf Islands, and, judging from the number of blinds built there, Bare Island seems to be a favourite haunt of these birds. In the interests of them alone a sanctuary should be provided, for the continual harrying of the flocks by sportsmen all over the Province leaves them scant opportunity to rest their weary wings and to glean a hasty meal. Apart from this, the strictly maritime birds of which I have already written are kept away from the island, and continual driving away, even outside of the nesting season, has a pronounced tendency to cause these birds to seek more secluded and therefore more distant spots in which to rear their young.

"Another reason for shooting on the island is that there are a number of rabbits there. Some years ago a very ill-advised person turned out some tame rabbits on several of the Straits islands, Bare Island being among them. The animals have increased and they are now an incentive to visiting hunters. A further evil in connection with these animals is their taking possession of the holes and crevices formerly occupied by puffins and guillemots, and driving these birds from many of their old breeding-haunts entirely. No time should be lost to exterminate the pests so as to allow the puffins to regain possession.

"Of other mammals on the island, a species of deer-mouse seems to be the only one. It is apparently somewhat different from the Mainland and Vancouver Island forms. These mice are quite harmless in relation to bird-life.

"Many fine flowering plants and shrubs adorn the island, especially in the early spring; one of the most notable, because of its rarity on the Pacific Coast, being the choke-cherry, which grows out of the dry, earthless crevices of the rock.

"Marine life is well represented about the reefs and pinnacles adjacent. On South Reef there may be found fine specimens of the large rock-pecten, sea-urchins, and a variety of smaller mollusks and crustaceans. I do not doubt that a large and most interesting collection could be made of marine life with proper appliances.

"I left the island on July 28th, having stopped there continuously, except for short trips occasionally to outlying rocks and islands. During the six weeks' sojourn several parties of whites arrived seeking to explore the island, and as they had no permits to land, I refused them according to instructions. Two parties of Indians landed, and one of these began robbing the gulls' nests. They, however, desisted when I spoke to them, after surreptitiously concealing the eggs they had gathered. These I afterwards found and photographed."

REPTILES AND BATRACHIANS.

This branch of the collection has been practically at a standstill for a number of years. Quite a number of specimens have been secured during the last two years' field-work. It is hoped to be able to carry on this work through the coming year, and have a number of the specimens already on hand sent to authorities for proper identification.

FISHES.

A most unusual visitant to this Coast was a sunfish (*Mola mola*) which was captured at Ucluelet, on the west coast of Vancouver Island, by some Indians fishing about two miles off-shore on July 14th, and presented to the Museum by Second Officer E. F. Jordan, of the S.S. "Tees." This appears to be the first record of this species north of San Francisco, California.

Another straggler, a white sea-bass (*Cymoscion nobilis*), was taken in the salmon-nets off Port Alberni, Barkley Sound, on the west coast of Vancouver Island, by Messrs. Butterfield and Mackie, and presented to the Museum through Deputy Game Warden, W. R. Carter, of Alberni. This is the third record of this fish having been taken along this Coast; the first was taken some years ago in Sooke Harbour by Sir Clive Phillipps-Wolley, and the second in Todd's traps at Sherringham Point, Strait of Juan de Fuca.

A number of smaller fishes have been added to the collection by our field collectors. These specimens have not, up to the present time, been studied and systematically arranged.

ENTOMOLOGY.

During the past three years much greater attention has been paid to this branch of natural history, with the result that the Museum collections have been enriched by large numbers of desirable specimens, many new to British Columbia and several new to science. The trip to Atlin undertaken by Mr. E. M. Anderson, of the Museum staff, in 1914 was very successful in this respect. Naturally a practically virgin country and one so little traversed by the entomologist would be expected to produce good results, and these expectations were fully realized by the quantity and quality of the material collected, over 2,000 insects being taken during the three months.

Amongst the butterflies taken on this trip were several very rare ones, and many new to the Province. viz.: *Parnassius smintheus var. nanus*, Neu.; *Papilio machaon var. aliaska*, Scudder (this is a very interesting and rare capture; very little is known about this insect, and thus far it has been taken only in Alaska and is still very rare in collections); *Eurymus hecla var. glacialis*, McLachlan (this is an exceedingly rare species, its habitat being Arctic America and Arctic Europe); *Brenthis triclaris*, Hub., a high-altitude species; *Brenthis polaris*, Bdv., an inhabitant of Arctic America; *Brenthis frigga* varieties *saga*, Kallen, and *improba*, Butler, the latter being still very rare in collections; *Erebia disa var. mancinus*, Dby., a beautiful

PLATE V.

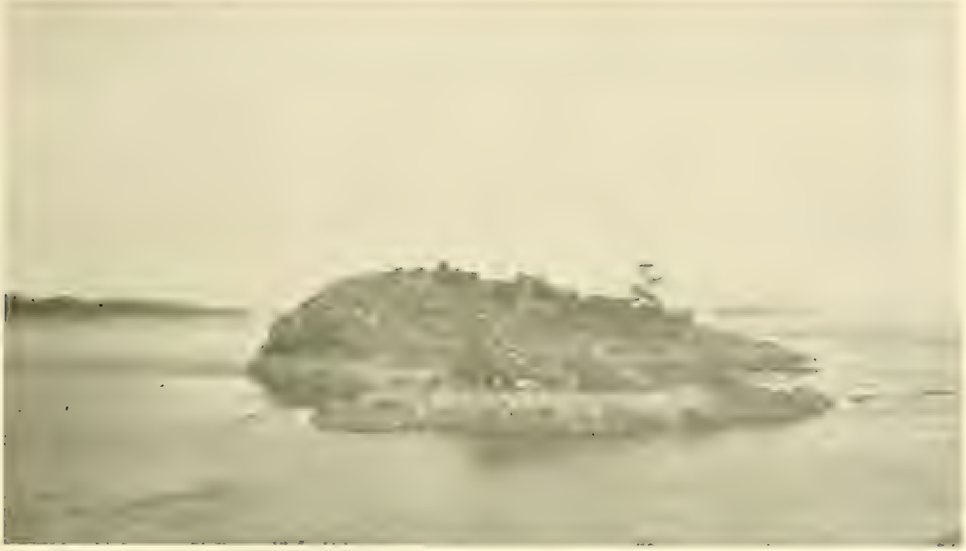


Fig. 1. Bare Island Bird Sanctuary, Haro Strait, near Sidney

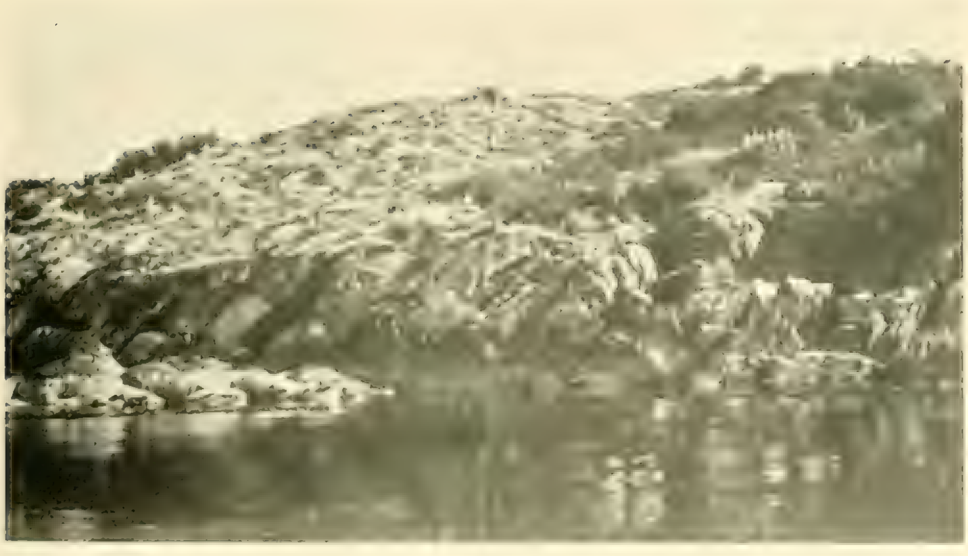


Fig. 2. Glaucous-winged Gulls nesting on Bare Island

PLATE VI.

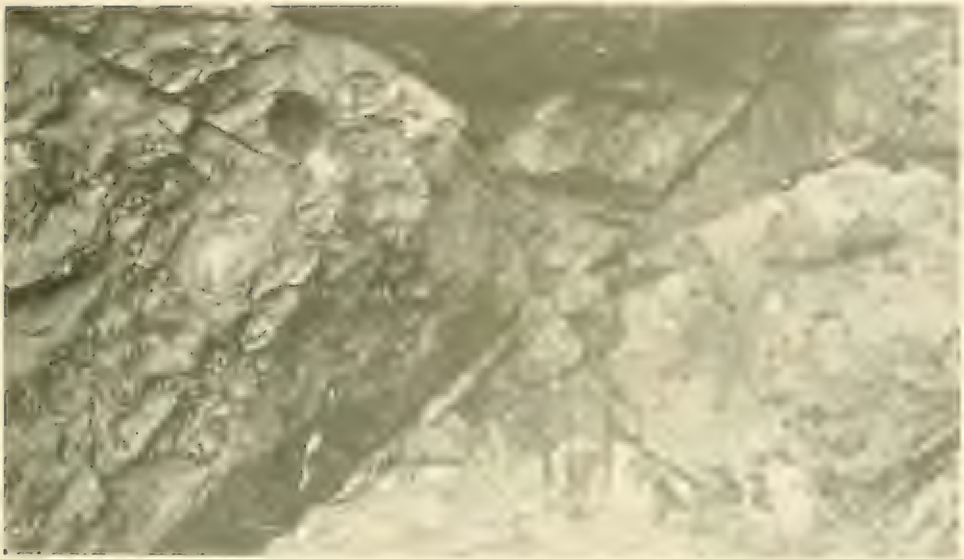


Fig. 1. Young Glaucous-winged Gulls on Bare Island, showing protective colouration.

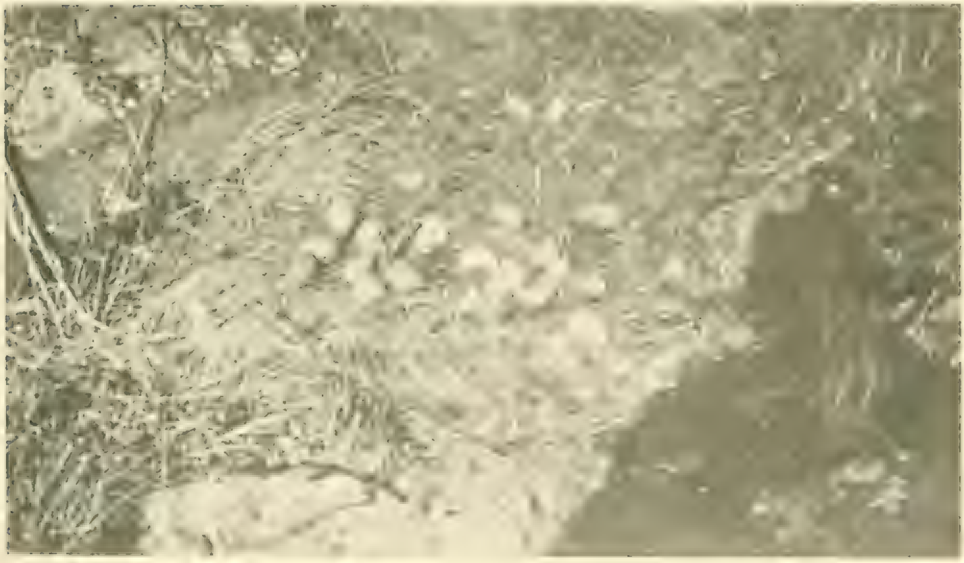


Fig. 2. Mass of egg-shells of the Glaucous-winged Gull. These eggs were dropped by Indians when caught robbing the Gulls' nests.
(*See* page 15.)

PLATE VII.

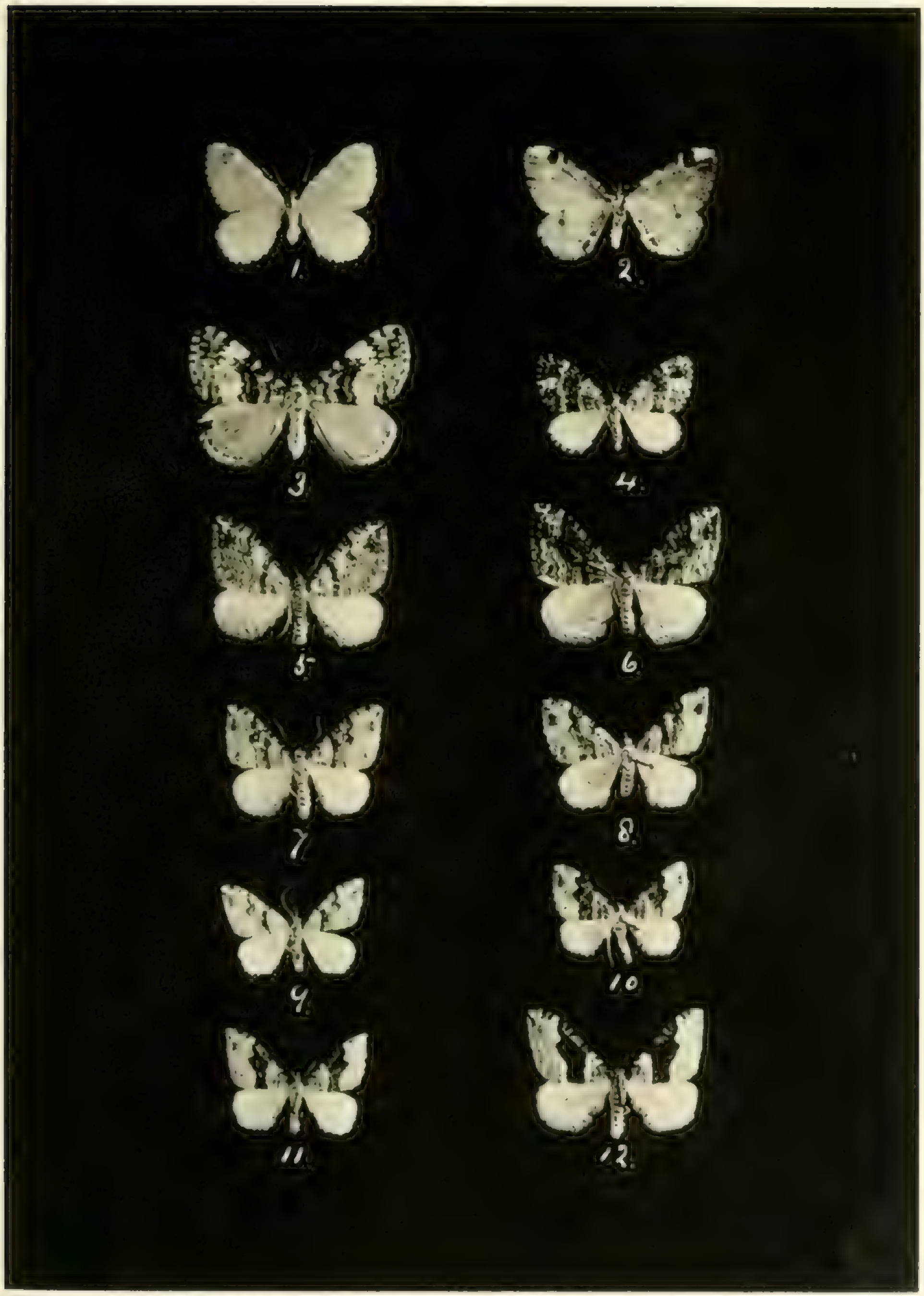
GEOMETRIDÆ NEW TO SCIENCE.

(Taken by E. H. Blackmore at Victoria, B.C.)

Fig. 1. *Stamnodes blackmorei* Swett. (Paratype male.)
Fig. 2. *Stamnodes blackmorei* Swett. (Under side.)
Fig. 3. *Hydriomena speciosata* var. *ameliata* Swett. (Type female.)
Fig. 4. *Hydriomena grandis* var. *saanichata* Swett. (Paratype female.)
Fig. 5. *Petrophora defensaria* var. *giganticaria* Swett. (Paratype male.)
Fig. 6. *Petrophora defensaria* var. *giganticaria* Swett. (Allotype female.)
Fig. 7. *Petrophora defensaria* var. *conciliaria* Swett. (Paratype male.)
Fig. 8. *Petrophora defensaria* var. *conciliaria* Swett. (Allotype female.)
Fig. 9. *Petrophora defensaria* var. *thanataria* Swett. (Paratype male.)
Fig. 10. *Petrophora defensaria* var. *thanataria* Swett. (Paratype female.)
Fig. 11. *Petrophora defensaria* var. *mephistaria* Swett. (Paratype male.)
Fig. 12. *Petrophora defensaria* var. *suppuraria* Swett. (Paratype male.)

(*See* page 18.)

PLATE VII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form which only occurs in high altitudes and in the extreme north; *Cœnonympha kodiak*, Edw., two specimens were taken (this I believe is new to Canada, its previously recorded locality being Alaska); *Œneis uhleri*, Rkrt., a Rocky Mountain species; *Œneis norna var. taygete*, Hub., a large series of this butterfly taken (this species was first recorded from Labrador in 1824); *Rusticus scudderi*, Edw. (this is closer to the typical form than the Eastern specimens going under this name); and *Hesperia centaureæ*, Rambur (this latter species occurs in the North Atlantic States and in Europe).

Moths were not so plentiful, noctuids being especially scarce; the long days with little or no darkness of this region in the summer-time making the usual attractions of "light" and "sugaring" of very little use. However, Mr. Anderson took several specimens of *Anomogyna, lætabilis*, Zett., which is an exceedingly rare noctuid moth hitherto only recorded from Labrador. These are the only known North American specimens in Canada at the present time. The specimens were taken flying at dusk on dates ranging from July 6th to 15th. This species also occurs in Arctic Europe, where, however, it is still very rare. The following noctuids taken are also new to the Province: *Hadena morna*, Streck; *Mamestra sutrina*, Grote; *Anarta cordigera*, Thunb.; *Anarta richardsoni*, Curtis; and *Autographa orophila*, Hampson.

Amongst the Geometridæ a large number of very desirable species were captured, including the following which are new to British Columbia, viz.: *Eustroma destinata var. lugubrata*, Mosch., a very handsome insect and quite rare; *Rheumaptera hastata var. hastulata*, Hub.; *Rheumaptera luctuata*, D. & S.; *Petrophora circumvallaria*, Taylor (this species was described from specimens taken at Calgary, Alberta); and *Leptomeris frigidaria*, Mosch., an inhabitant of Arctic America.

Good collections in Coleoptera, Hymenoptera, and Diptera were made, many of which still await classification and identification.

During the past season a quantity of material in this branch has been collected by Mr. E. M. Anderson in the Sahtlam District, Vancouver Island (1,382 specimens), Mr. J. A. Munro at Okanagan Landing (1,900 specimens), and Mr. C. Garrett at Cranbrook (1,627 specimens).

Amongst the many good things taken by Mr. Anderson the following Noctuidæ are rare: *Feralia columbiana*, Smith; *Rhynchagrotis niger*, Smith; *Noctua calgary*, Smith; *Rancora solidaginis*, Behr.; *Euchalcia putnami*, Grote; and *Eosphoropteryx thyatiroides*, Gue. *Mamestra radix*, Walker, is new to Vancouver Island, and the following are new to British Columbia: *Autographa bimaculata*, Stephens; *Melalopha albosigma var. specifoca*, Dyar, belonging to the family Notodontidæ; and *Albuna pyramidalis var. montana*, Hy. Edw., a member of the Sesiid group. In the Geometridæ, whilst nothing new was taken, there nevertheless were some very desirable species, of which the following are worthy of mention: *Eupithecia perfusca*, Hulst; *Dysstroma occidentalis*, Taylor; *Hydriomena multiferata*, Walker; *Chlorosea nevadaria*, Pack.; *Aplodes darwiniata*, Dyar; *Euchlaena mollisaria*, Hulst; *E. pectinaria*, D. & S.; and *Metanema quercivoraria*, Gue. It is well to note that several specimens of that pretty little butterfly *Pamphila palaemon*, Pall., were taken, a species which is rapidly becoming extinct on the southern portion of Vancouver Island.

The material collected by Mr. Munro, while large in quantity, did not produce many rare species, the following Noctuidæ being most worthy of note: *Hadena allecto*, Smith; *Rhynchagrotis trigona*, Smith; *Agroperina pendrina*, Smith; *Euxoa obeliscoides*, Gue.; and *Graphiphora curtica*, Smith. However, one variety new to British Columbia was taken—*Platyprepia virginalis var. guttata*, Bdv., a moth belonging to the Arctiidæ family.

Mr. C. B. Garrett, of Cranbrook, also added four more species to the list, viz.: *Agroperina lineosa*, Smith; *Mamestra canadensis*, Smith, previously recorded from New Brunswick; *Syneda seposita*, Hy. Edw.; and *Cerygonis octus*. Amongst the Geometridæ taken by Mr. Garrett there were three species new to the Province, viz.: *Leptomeris ancellata*, Hulst; *Diastictis occiduaria*, Packard; and *Metanema determinata*, Walker (this latter an inhabitant of the Atlantic States). In addition to these, the following desirable species were taken: *Eutrepia multivagata*, Hulst; *Marmopteryx marmorata*, Packard; *Euchlæna johnsonaria*, Fitch; and *E. astylusaria*, Walker.

Mr. W. A. Newcombe, of Victoria, B.C., while in the Chilcotin District this past summer took five specimens of *Basilarchia arthemis*, Drury. This is a very interesting record, as it definitely settles the fact that this butterfly does occur in British Columbia. Although this species has never been admitted to the list, it has been a debatable subject for some years as to whether it did or did not occur in the Province. Its habitat is the North Atlantic States, but it is also taken in the three Prairie Provinces.

During the past two years Mr. E. H. Blackmore, of Victoria, B.C., who has been specializing on the Geometridæ of British Columbia, has discovered one species and seven varieties new to science, viz.: *Stamnodes blackmorei*, Swett; *Hydriomena speciosata var. ameliata*, Swett; *Hydriomena grandis var. saawichata*, Swett; *Petrophora defensaria* varieties *mephistaria*, *giganticaria*, *conciliaria*, *thanataria*, and *suppuraria*, all described by Swett. Mr. Blackmore has generously donated to the Museum collection paratypes of *S. blackmorei*, *H. grandis v. saawichata*, *P. defensaria* varieties *giganticaria*, *conciliaria*, and *thanataria*, and typical specimens of *P. defensaria* varieties *mephistaria* and *suppuraria*.

Amongst a collection of Diptera sent to the Smithsonian Institution, Washington, D.C., for identification, three species were found to be new to science, which necessitated the erection of new genera by Mr. C. H. T. Townsend, who described them in the Canadian Entomologist, Vol. XLII., No. 9, page 285, *et seq.* They are as follows:—

Okanagania hirta, Townsend. This is a new genus with *hirta* as its genotype, and was described from a male taken by Mr. E. M. Anderson at Okanagan Falls on April 27th, 1913.

Rhachogaster kermodei, Townsend. This is also a new genus with *kermodei* for its genotype, and was described from two males taken at Penticton by Mr. Anderson on July 4th and 8th, 1913.

Another new genus, *Pseudodidyma*, was created by Mr. Townsend, having for its genotype a new species named *pullula*, described from a female taken at Farragut Bay, Alaska. Of a male taken by Mr. Anderson at Victoria on April 2nd, 1906, Mr. Townsend says: "It may be a new species, but seems congeneric with the above female."

During the present winter the two exhibition cases of Lepidoptera have been entirely overhauled by Mr. Anderson, who has rearranged and relabelled the entire collection of butterflies and moths down to the Geometridæ, the latter having been put in order by Mr. E. H. Blackmore, of this city, who has contributed many specimens in this group to make it more complete. The collection as it now stands is thoroughly up to date in nomenclature and scientific arrangement.

BOTANY.

In pursuance of the policy announced in the Museum Report for 1914, to devote more attention to the Botanical Branch, a request was made early in the year for the loan of the Herbarium formed by Mr. J. R. Anderson when Deputy Minister of the Department of Agriculture. This request was favourably considered and the transfer made to the Museum on April 28th. The collection of plants was made by Mr. J. R. Anderson in his leisure hours, both on Vancouver Island and in districts on the Mainland visited by him on his official tours. In some of these expeditions Mr. Anderson was assisted by the late Dr. James Fletcher, of the Dominion Experimental Farm at Ottawa, who was well known for his botanical zeal. It was, of course, impossible to cover more than a small portion of a Province of such a vast area as that of British Columbia, but a large number of rare and interesting plants were secured as occasion offered, and it is hoped that these may form the nucleus of a more fully representative collection, and also be more accessible to the general public than heretofore. To facilitate reference to these plants it is proposed to make a card catalogue of the collection, as unfortunately no record of the Herbarium accompanied it, except the data on the labels. By comparing these cards with the catalogues and supplementary lists published by Professor John Macoun in the Reports of the Geological and Natural History Survey of Canada and in numerous other papers, and also with the "Flora of Southern British Columbia," by Professor Henry, it will be possible to discover the species still absent from our collection and to set in motion certain agencies to fill the blanks.

Professor John Macoun and his son, Mr. J. M. Macoun, have both interested themselves in this Herbarium for years. Mr. J. M. Macoun spent some hours in the Museum in September looking over the new collections.

In the flowering season many inquiries are made as to the names of the more popular plants, and as to where their description can be found. To meet these demands it is intended that specimens of some of the most noticeable plants may be mounted and placed in wall-frames, also that some of the more useful books will be held available in the office of the Museum in charge of Miss W. A. Andrew, who has shown great interest in this branch of our work.

PLATE VIII.

Fig 1 *Papilio machaon* var. *aliaska* Scudder.
Fig. 2. *Parnassius smintheus* var. *nanus* Neumoegen. (Male.)
Fig. 3. *Parnassius smintheus* var. *nanus* Neumoegen. (Female.)
Fig. 4 *Eurymus hecla* var. *glacialis* Maclachlan. (Male.)
Fig. 5. *Eurymus hecla* var. *glacialis* Maclachlan. (Female.)
Fig. 6. *Brenthis polaris* Boisduval. (Male.)
Fig 7. *Brenthis frigga* var. *saga* Kaden. (Female.)
Fig. 8. *Brenthis frigga* var. *improba* Butler. (Under side.) (Female.)
Fig. 9. *Brenthis frigga* var. *improba* Butler. (Under side.) (Male.)

(*See* page 16.)

PLATE VIII.

PLATE IX.

Fig. 1. *Erebia disa* var. *mancinus* Doubleday. (Male.)
Fig. 2. *Erebia disa* var. *mancinus* Doubleday. (Female.)
Fig. 3. *Oeneis jutta* Hubner. (Male.)
Fig. 4. *Oeneis jutta* Hubner. (Female.)
Fig. 5. *Oeneis norna* var. *taygete* Hubner. (Male.)
Fig. 6. *Oeneis norna* var. *taygete* Hubner. (Female.)
Fig. 7. *Oeneis uhleri* Reakirt. (Male, northern form.)
Fig. 8. *Oeneis uhleri* Reakirt. (Female, northern form.)
Fig. 9. *Anomogyna lætabilis* Zett. (Male.)
Fig. 10. *Anomogyna lætabilis* Zett. (Female.)

(*See* page 16.)

PLATE IX

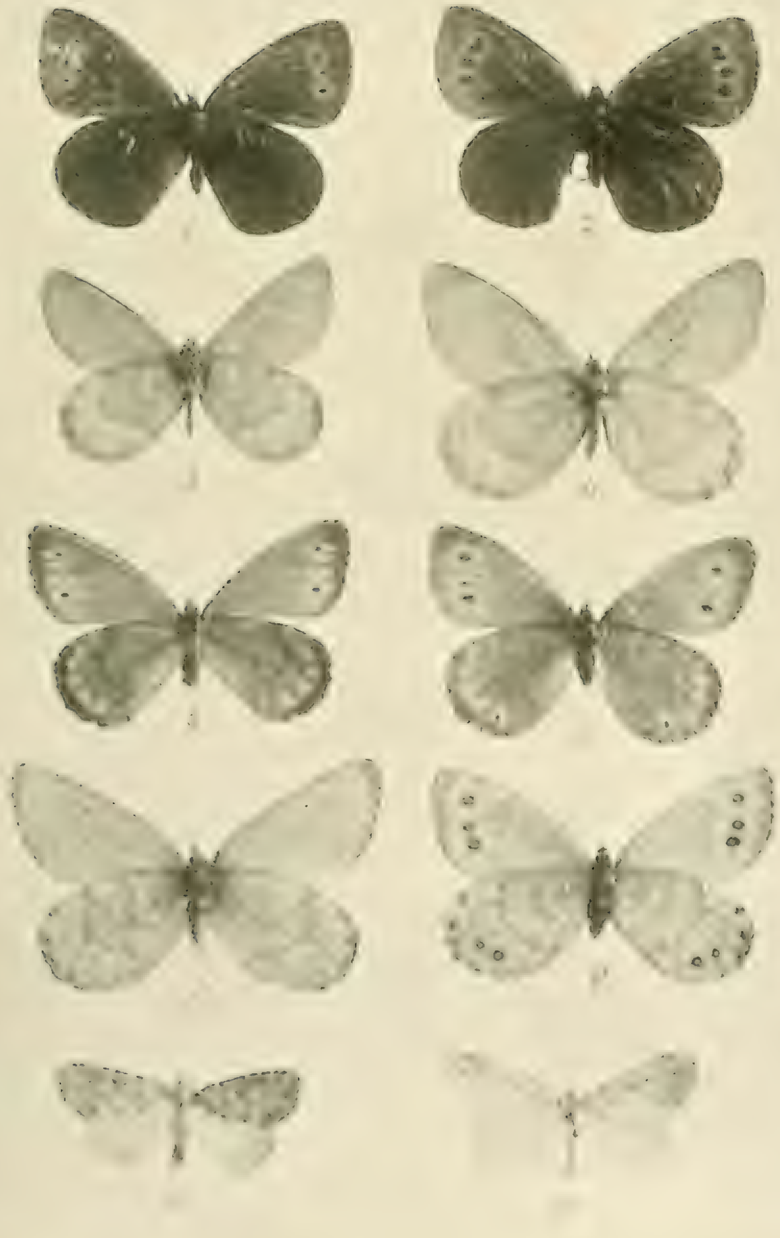

PLATE X.

NEW SPECIES OF DIPTERA

Fig. 1. *Rhachogaster kermodei* Townsend. Penticton, B.C., July, 1913 (E. M. Anderson). Magnified 4¼ times.

Fig. 2. *Pseudodidyma pullula* Townsend. Victoria, B.C., April, 1906 (E. M. Anderson). Magnified 8½ times.

Fig. 3. *Okanagania hirta* Townsend. Okanagan Falls, B.C., April, 1913 (E. M. Anderson). Magnified 5½ times.

(*See* page 18.)

PLATE X.

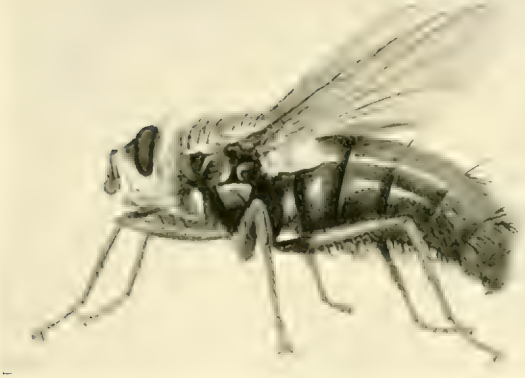

Fig. 1

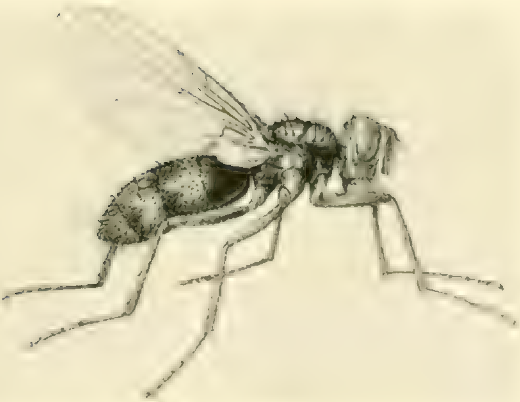

Fig. 2

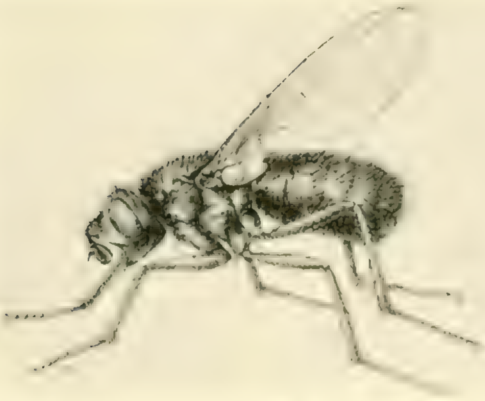

Fig. 3

Amongst the accessions to the Herbarium are:—

(1.) A collection made by Mr. E. M. Anderson in the Atlin region in 1914, to which brief mention was made in last year's report. This contains a number of rare species, and the collection has been listed as follows by Professor John Macoun and his son, Mr. J. M. Macoun, mentioned above:—

Polypodium occidentale (Hook), Maxon.
Aspidium spinulosum, Swartz.
Aspidium fragrans, Swartz.
Cystopteris fragilis, Bernh.
Lycopodium annotinum, L.
Luzula spadicea melanocarpa, E. Meyer.
Eriophorum polystachion, L.
Veratrum viride, Ait.
Tofieldia glutinosa, Willd.
Tofieldia borealis, Wahl.
Zygadenus elegans, Pursh.
Cypripedium passerinum, Rich.
Habenaria dilatata, Pursh.
Habenaria hyperborea, R. Br.
Habenaria obtusata, Richards.
Smilacina sessifolia, Nutt.
Smilacina amplexicaulis, Nutt.
Orchis rotundifolia, Pursh.
Polygonum viviparum, L.
Silene acaulis, L.
Cerastium arvense, L.
Stellaria longipes, var.
Arenaria lateriflora, L.
Anemone multifida, Poir.
Anemone patens, L., var. *Wolfgangiana* (Bess), Koch.
Anemone parviflora, L.
Caltha leptosepala, DC.
Aquilegia formosa, Fisch.
Corydalis aurea, Willd.
Draba alpina, var. hebecarpa, Gray.
Arabis lyrata occidentalis, S. Wats.
Arabis drummondii, A. Gray.
Sedum stenopetalum, Pursh.
Saxifraga occidentalis, Wat.
Saxifraga tricuspidata, Retz.
Saxifraga oppositifolia, L.
Mitella trifida, Gray.
Parnassia palustris, L.
Rubus arcticus grandiflorus, Ledeb.
Potentilla dissecta, Pursh.
Potentilla nivea, L.
Potentilla fruticosa, L.
Potentilla palustris, L.
Dryas integrifolia, Ch. & Sch.
Lupinus arcticus, Wats.
Lupinus nootkatensis (!)
Hedysarum boreale, Nutt.
Oxtropis lamberti, Pursh.
Astragalus alpinus, L.
Geranium erianthum, DC.
Viola nephrophylla, Greene.
Viola langsdorfii, Fischer.
Epilobium latifolium, L.
Epilobium augustifolium, L.
Cornus canadensis, L.
Moneses uniflora, Gray.
Pyrola incarnata, DC.
Cassiope mertensiana, G. Don.
Kalmia glauca, Ait.
Ledum latifolium, Ait.
Vaccinium cæspitosum, Mx.
Primula sibirica, Jacq.
Androsace occidentalis, Pursh.
Polemonium cæruleum, L.
Polemonium elegans, Greene.
Polemonium pulchellum, Bunge.
Polemonium humile, R. & S.
Mertensia platyphylla, Heller.
Mertensia paniculata (Ait.) Don. (albino).
Myosotis sylvestris, L.
Myosotis sylvatica var. alpestris. Koch.
Myosotis alpestris, Lehm.
Pentstemon confertus cæruleo-purpureus, A. Gray.
Pentstemon confertus, Dougl.
Mimulus langsdorfii, Donn.
Pedicularis capitata, Adams.
Pedicularis euphrasioides, Stephen.
Pedicularis langsdorfii, Fisch.
Castilleja pallida, Kunth.
Pinguicula vulgaris, L.
Galium boreale, L.
Linnæa borealis, Gron.
Valeriana sitchensis, Bong.
Solidago multiradiata, Ait.
Solidago multiradiata, Ait., var. *scopulorum*, Gr.
Erigeron compositus, Pursh.
Aster sibiricus, L.
Achillæa borealis, Bong.
Arnica cordifolia, Hook.
Senecio lugens, Rich.
Senecio cymbalarioides, Nutt.
Antennaria microphylla var. rosea, Greene.

(2.) A collection from the Okanagan country by Mr. J. A. Munro (43 species).

(3.) A collection from Bare Island, in the Gulf of Georgia, by Mr. W. B. Anderson (25 species).

(4.) A collection from Uchucklesit, Barkley Sound, by W. B. Anderson.

(5.) A collection from Sahtlam District, Vancouver Island, by Mr. E. M. Anderson (35 species).

(6.) A collection from Cranbrook, East Kootenay, by Mr. C. Garrett, now in the hands of Mr. J. M. Macoun, Ottawa.

(7.) A collection from Chilcotin District by W. A. Newcombe (over 100 species).

Also minor accessions have been received from Professor Henry, of Vancouver, Dr. C. F. Newcombe, and several local specimens have been added by the Museum staff.

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Page 118: List of plants of Yale.

Page 186: List of plants of Vancouver Island; British Columbia to base of Rockies; and Rocky Mountains.

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PLATE XI.

Fig. 1. Mammoth tooth (*Elephas primigenius* Blum.), Shuswap Lake. Presented by the late Frederick Hussey.

Fig. 2. Mastodon tooth (*Mastodon americanus* Cuvier), found 1903, Dago Gulch, Hunker Creek, Y.T. Bequest: the late Mrs. C. A. Coulson.

Fig. 3. Mammoth tooth (*Elephas primigenius* Blum.), Cordova Bay, Victoria.

(*See* page 21.)

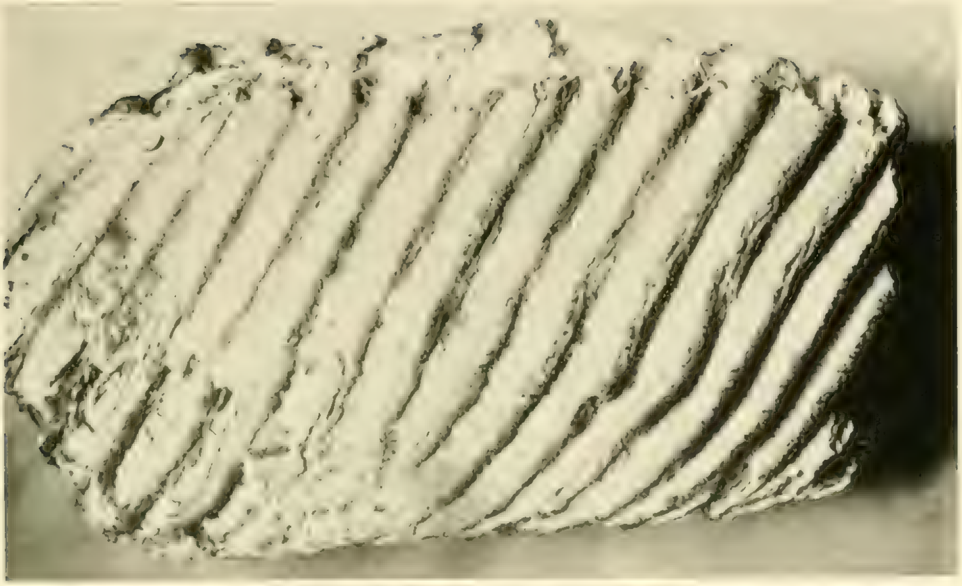

Fig. 1

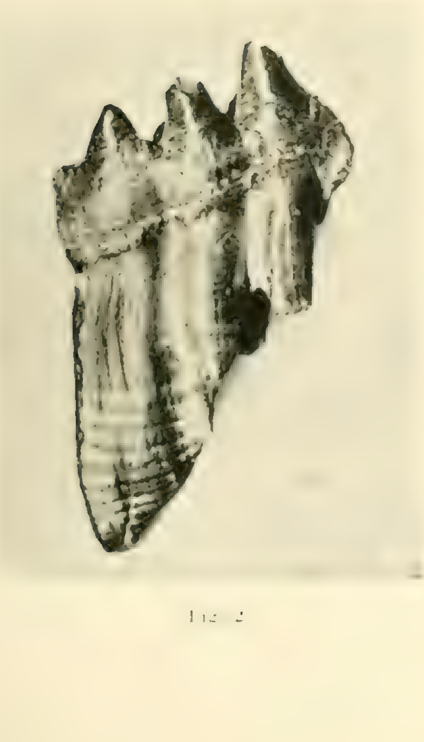

Fig. 2

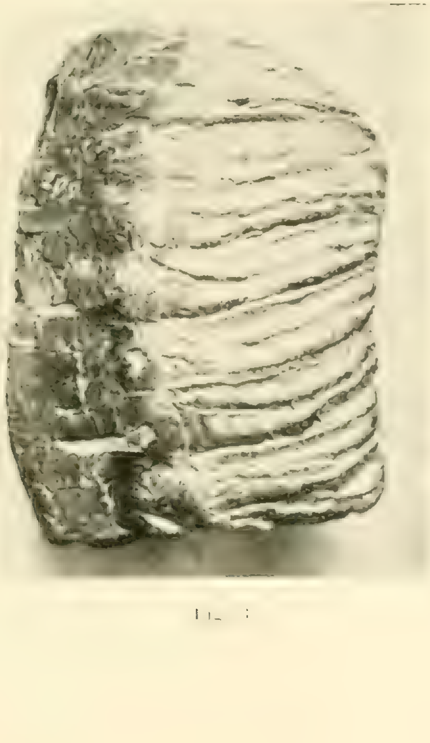

Fig. 3

PALÆONTOLOGY.

Accessions to the palæontological collection have been of late years few and far between. Early in 1915, however, the finding of a tooth of a fossil elephant in the Mount Tolmie gravel aroused fresh interest in our small collection of mammalian remains. On comparing this specimen with fossil elephant-teeth from the Yukon country, it presented several marks of distinction. Photographs of two teeth from the Yukon and three from Vancouver Island and the neighbouring regions were sent to Dr. O. P. Hay, of Washington, who has written largely on the subject of Pleistocene fossils. He reported that, in his opinion, the northern specimens were true molars belonging to the hairy mammoth *Elephas primigenius*, while those from the south, which had fewer and wider plates, belonged to the Columbian elephant *E. columbi*.

Another specimen which has been in the Museum for many years was identified by Dr. O. P. Hay as the worn vertebra of some species of whale. This was found in Pleistocene gravels between Parson's Bridge and Langford Lake, Vancouver Island, when collecting ballast for the Esquimalt & Nanaimo Railway.

In the year 1913 remains of bison were recorded from two parts of the Province. In the Atlin country Mr. E. M. Anderson found a fine skull with horns. In the low-lying ground between George Jay Public School and the Protestant Orphanage, east of Cook Street, Victoria, Dr. C. F. Newcombe found a fragment of horn which the Director identified as belonging to a species of bison. Both of these specimens were forwarded for examination to Mr. Lawrence M. Lambe, Vertebrate Palæontologist of the Geological Survey, Ottawa. The Victoria fragment, in his opinion, belongs to *Bison bison*. His report on the Atlin specimen is given herewith in his own words:—

"The occiput with horn cores from the Atlin District is of *Bison bison* (L.), (*B. americanus*); that is, I regard it as such. It gives measurements which place it in this species. The range of the American bison extended up into the Mackenzie River District, and these animals are known to have passed well into the Rocky Mountains. It is probable that your specimen was a straggler toward the Coast in the Far North, or possibly the range of the buffalo extended well westward from the Mackenzie District, the animals taking advantage of the broad and comparatively low passes through the northern mountains. The specimen is light and not at all fossilized. Whether it belonged to a wood buffalo, which appears to be not more than a subspecies of the plains buffalo, it is difficult to say."

Mr. Lambe was also good enough to make a careful examination of a tooth of a mastodon which has been for many years in the Museum. His report upon it follows:—

"The tooth from Yukon is of *Mastodon americanus* (Cuvier), and is a lower third true molar of the left side. The front transverse ridge is broken off and with it the front root, which was slender and, in comparison with the hinder one, of small size. The specimen has been considerably shaken in transit and some fragments have become detached. These I have cemented back in place. Your tooth is an excellent one, although not complete. As you know, remains of mastodon are, in comparison with those of mammoth, rather rare in the extreme North-west."

Four casts of a scallop were presented by Mr. A. J. Dempster, found in a road-cut at Clo-oose, Vancouver Island. They seem to belong to *Pecten branneri*, Arnold, and to have come from the Monterey formation.

GENERAL ACCESSIONS.

Jan. 25. White-tail Ptarmigan. Presented by W. B. Conroy, Atlin.
Feb. 15. Indian stone sharpener (?), found on Dallas Road foreshore, Victoria, and presented by Arthur Warren.
„ 24. Indian basket. Purchased.
March 12. Western Evening Grosbeak (3), Parksville, V.I. Presented by H. Rawlins.
„ 17. Marine specimens (16), Prince Rupert. Presented by M. L. Bird.
„ 20. Fossil pectens, Clo-oose. Presented by A. J. Dempster.
April 6. Indian stone anchor, found while excavating for breakwater, Dallas Road, Victoria. Presented by A. J. Elgee, C. E.
„ 18. Sparrows (2). Presented by Dr. E. Hasell, Victoria.
„ 26. Crayfish, Victoria Harbour. Presented by A. Halkett through the Natural History Society of British Columbia.
May 21. Slate totem-poles, Queen Charlotte Islands. Purchased.

June 5. Indian stone hammer, found on Graham Island. Presented by Pte. Geo. S. Mayer, 48th Battalion, C.E.F.
July 14. Sunfish, caught by Ucluelet Indians three miles off shore. Presented by S.S. "Tees" through E. F. Jordan, second officer.
„ 29. *Prionus californicus.* Presented by Geo. Nelm, Ganges, B.C.
Aug. 15. Silk-moth. Presented by Laura Carrington, Nicola.
Sept. 5. 1 nest and eggs, Mallard
2 „ Willow Thrush
2 „ Redstart
1 „ Audubon's Warbler
2 „ Shufeldt's Junco
2 Squirrel
1 Chipmunk
1 White-footed Mouse
1 Sparrow Hawk
1 Gambel's Sparrow
1 Shufeldt's Junco
1 Western Meadowlark
1 Ruby-crowned Kinglet
1 Willow Thrush
Miscellaneous collection of 300 papered insects
Presented by W. A. Newcombe; collected in Chilcotin District.
Sept. 6. Jack-hare, White Lake. Presented by C. deB. Green.
„ 14. Broad-finned Cod, Saanich Inlet. Presented by A. H. Maynard.
„ 20. Painted Fish, Gulf of Georgia. Presented by P. Walker.
„ 22. Sea Pen, Trial Island. Presented by B. Bonner.
„ 30. White Sea Bass, Port Alberni. Presented by Messrs. Butterfield and Mackie.
Oct. 7. California Quail, Victoria. Presented by R. Powell.
„ 20. Camp Robber's nest and set of three eggs. Purchased.
„ —. Lynx. Presented by Beacon Hill Park.
Nov. 4. Indian Mask, Metlakatla. Purchased.
„ 6. Small mammals, Okanagan District. Purchased.
„ 15. Chipmunk (in alcohol). S. Hadwen. Experimental Farm, Agassiz.
Dec. 1. Stone sinker, found on Brentwood beach, V.I. Presented by A. Shotbolt.
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1916.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1916

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
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1917.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1916

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

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Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1917.

To His Honour FRANK STILLMAN BARNARD,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Provincial Museum of Natural History for the year 1916.

J. D. MacLEAN,
Provincial Secretary.

Provincial Secretary's Office, Victoria,
March, 1917.

Provincial Museum of Natural History,
Victoria, B.C., March 24th, 1917.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1916, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

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PLATE I

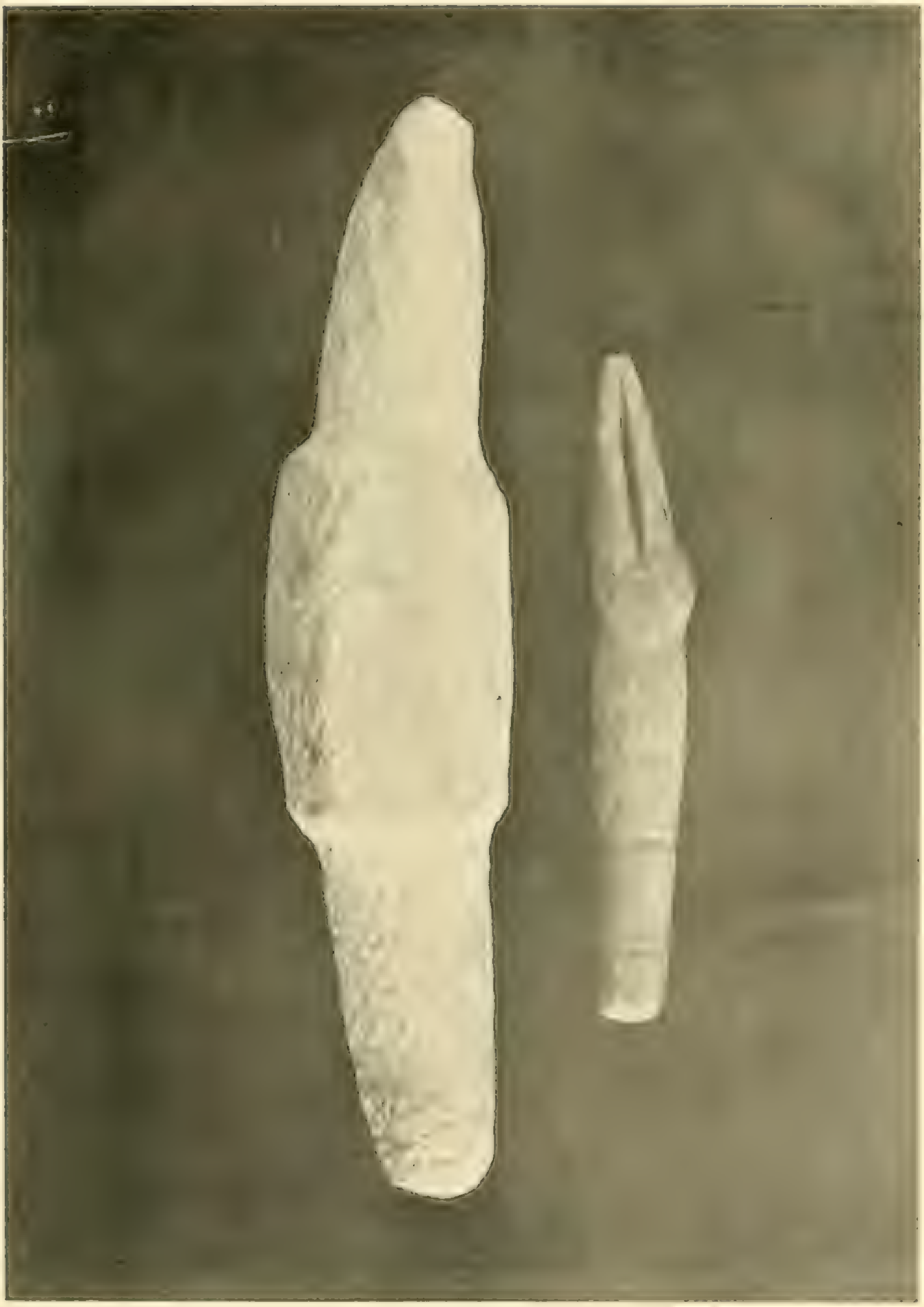


Fig. 1. Stone pile-driver (Cat. No. 289
Fig. 2. Carved stone baton

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1916.

In reviewing the activities of the Provincial Museum for the year ending December 31st, 1916, it is to be noted that considerable progress has been made, and that a number of rare specimens have been added to the collection, with valuable data.

At the beginning of the year the Director was informed that all departments of the Civil Service would be expected to exercise the strictest economy and still keep up efficiency. With that end in view the work in the Provincial Museum has been carried on throughout the year. Only two parties were sent afield for any length of time during the summer months.

Mr. J. A. Munro was engaged from the middle of April to the end of October to carry on the biological investigations commenced last year in the Northern Okanagan and Shuswap Districts.

Mr. E. M. Anderson, of the Museum staff, was stationed in the Lillooet District from the beginning of May to the end of July, headquarters being established at the Provincial Government Hatchery, at Seton Lake, by kind permission of Mr. J. P. Babcock, Assistant to the Commissioner of Fisheries. Mr. Anderson made trips to Blackwater Lake, and also ascended Mount McLean, where some good material was secured, of which no detailed reports have been received.

The Director, accompanied by Dr. C. F. Newcombe, also visited this district, and secured some very interesting specimens for the Herbarium, also for the anthropological sections.

The matter of obtaining Bare Island for a permanent bird sanctury has not made any further advancement. However, the Director made special arrangements again with the Indian Department for this Department to place a guard on the island during the nesting season to look after the preservation of bird-life. This arrangement has done away with the proposed matter of arbitration for the present, and is very satisfactory, as it does not prevent the Indians from camping there while gathering "camas," which is used extensively by them for food.

It will be noticed by the following lists that the field collectors have collected a vast amount of material other than their special line of birds and mammals, more particularly in collecting the plants of the district where they were located, which means a great deal of labour and time in addition to their other duties. Nearly all the botanical specimens have been identified by Mr. J. M. Macoun, of Ottawa, who has always shown a great interest in the Herbarium of the Provincial Museum.

Mr. W. R. Carter, of Alberni, has also taken a keen interest in the botanical branch, and has secured some very rare and interesting specimens for this Department.

The Director is also pleased to report that to the collection of fishes has been added several species new to British Columbia, namely: Sunfish (*Mola mola*), giant black bass (*Erilepis zonifer*), also a species of frostfish (*Benthodesmus atlanticus*), of which there is only one other known specimen.

The entomological collection has been greatly enriched by several new species, and others that are new to the Province.

Several good additions have been made to the anthropological collection. Three stone hammers were presented to the Director for the Museum while on a trip to Seton Lake, and although the Indian reservations were visited by the Director and Dr. C. F. Newcombe, little or no information could be secured concerning them, the present generation not appearing to know for what use they had been intended.

Information was received later from Lieutenant F. C. Swannell, B.C.L.S., of this city, who has one of these hammers in his possession, who states that he had received the information from the chief of the Lillooet Indians, which confirms our theory that these implements were used as pile-drivers. One of these specimens is figured in this report.

One of the most interesting specimens that has been added to the collection of fossils is the molar tooth of an extinct Sirenian species (*Desmostylus hesperus*), which is a close relation to the recently extinct mammal, the arctic sea-cow of the North Pacific, that was practically exterminated about the year 1780.

The Provincial Museum wishes to extend grateful thanks to the following gentlemen who have greatly assisted with identifications in their respective branches of biology:—

Identification of Birds and Mammals.—The Biological Survey, United States National Museum, Smithsonian Institution, Washington, D.C.; Mr. Henshaw, Chief of the Biological Survey; also Mr. H. C. Oberholser and others.

Identification of Entomological Specimens.—The Bureau of Entomology, Washington, D.C. (L. O. Howard, Chief); Mr. F. H. Wolley Dod, of Calgary; Doctors Barnes and McDunnough, of Decator, Ill.; Mr. L. W. Swett, Boston, Mass.; and Mr. E. H. Blackmore, Victoria.

The thanks of the Department are also due to Professor John Macoun, Naturalist of the Geological Survey, Ottawa, who is now a resident of Sidney, B.C.; Mr. J. M. Macoun, C.M.G., Curator of the Herbarium, Ottawa; C. F. Newcombe, M.D., Victoria, B.C.; Mr. Lawrence M. Lambe, Palæontologist, Ottawa; Dr. Merriam; Dr. Ralph Arnold, well-known geologist of Berkeley, California; and Mr. B. L. Clark, of the University of California. Also to the following for notes on bird migrations and for specimens presented to the Museum; J. E. Kelso, M.D.; W. B. Johnson and others at Edgewood, Lower Arrow Lakes; W. R. Carter, Deputy Game Warden, Alberni; W. A. Newcombe, Victoria.

ANTHROPOLOGY.

ACCESSIONS, 1916.

Tsimshian.

The following were purchased from Chief Aksidar, Kincolith:—

Stone mortar (2882). A large specimen; formerly used for pounding the native tobacco.

Shaman's head-dress of grizzly-bear claws (2883).

Cellular lava (2884-2885). Used at dances.

Cannibal dancer's head-rings (3) of cedar bark (2886-2887-2888).

Cannibal dancer's neck-ring (2889).

Basket, spruce-root (2898). From Kispiox, Skeena River. Presented by Lieutenant G. T. Emmons, U.S.A.

Mirror, stone (2899). From Hoquelget, Bulkley River, a village site belonging to the Tsimshian Hazelton band, but occupied by the Hoquelgets, an Athabascan band (2900).

Mask, copper, representing a human face. Used in winter dances. From Kispiox, Skeena River. From Lieutenant G. T. Emmons, U.S.A., in exchange.

Salishan of the Coast.

Pictograph (2874). Cast of an Indian carving on the surface of an outcrop of sandstone near Chase River, Nanaimo, B.C. From a mould made by Harlan I. Smith for the Jesup North Pacific Expedition, 1898, and illustrated in his "Archæology of the Gulf of Georgia," Vol. IV., Mem. Amer. Mus. of Nat. Hist. In exchange from Geological Survey of Canada.

Arrow-head of chipped stone (2897). From dry bed of ancient lake, Gonzales Farm, Victoria, B.C. Presented by W. B. Anderson.

Mat of coloured wool (2903). Shows designs used in the old ceremonial blankets. Purchased from Mrs. W. Charles.

Salishan Interior—Lillooet.

Nephrite boulder (2890). Slices have been sawed off it of which to make stone chisels, etc. From Seton Lake. Presented by L. Keary.

Hammer, stone (2893). Seton Lake. Presented by L. Keary.

Hammer, stone (2894). Seton Lake. Presented by J. P. Babcock.

Pile-driver, stone, two-handed (2891). Seton Lake; probably used for driving piles when setting up fish-weirs. Presented by L. Keary.

Pile-drivers (2), stone, two-handed (2895-2896). North shore, Seton Lake. Presented by W. R. Bellamy.

Hammer, stone (2892). Purchased at Indian village, Lillooet.

PLATE II

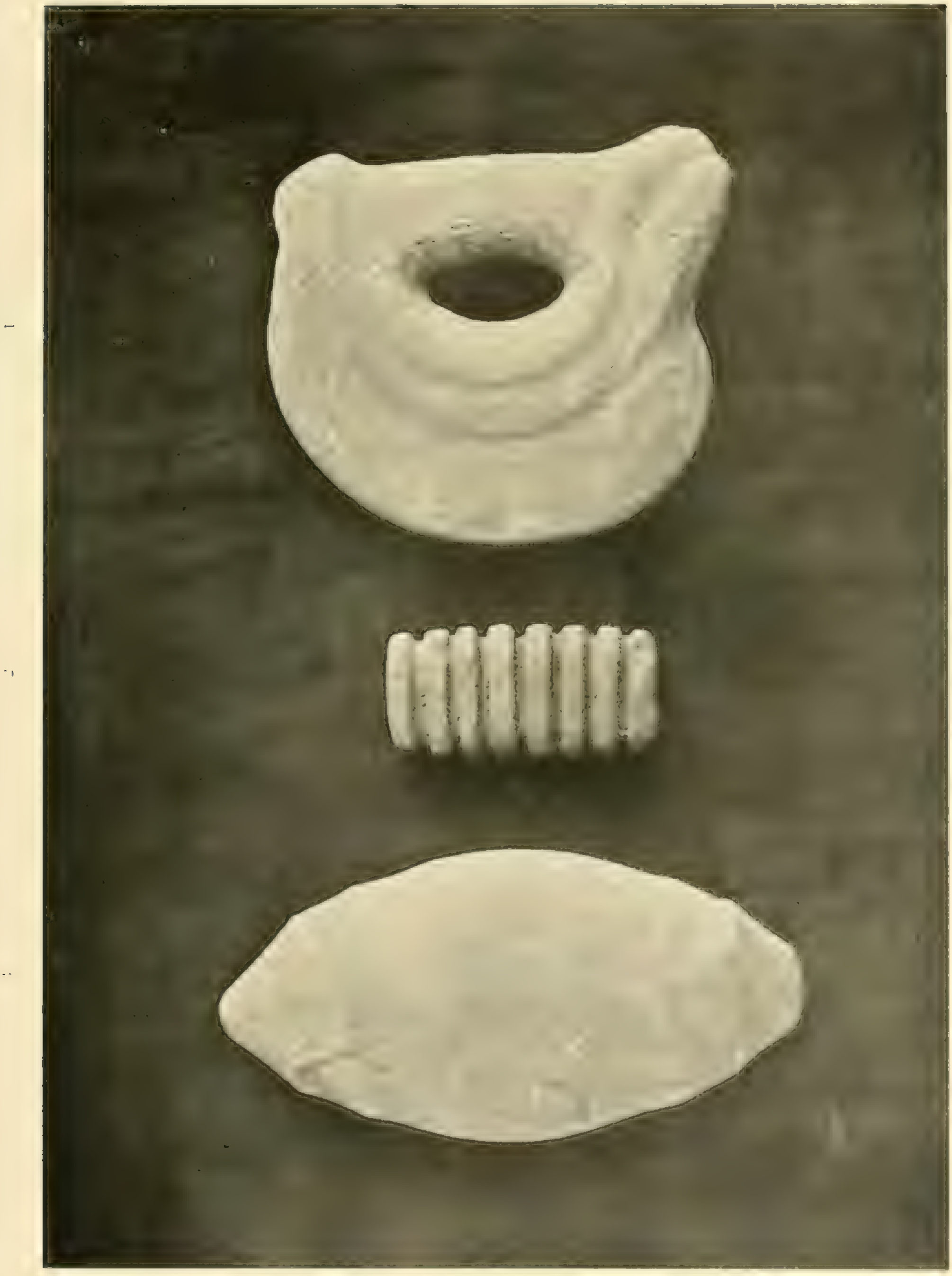


Fig. 1. Stone [illegible] (Cat. No. 1801).
Fig. 2. Stone [illegible] (Cat. No. [illegible]).
Fig. 3. Stone hand hammer (Cat. No. 17[illegible]

Tlingit.

Chilkat blanket (2901). Purchased from Hon. Mr. Justice Martin.

Haidan.

Hat, spruce-root, with painted crest (2902). Purchased from Mrs. Wm. Charles.

Athabascan.

Tobacco-bag, with ornamental bead-work (2877). From Hudson Hope, north of Peace River. Presented by Chief Constable Thos. Parsons.

Bag ornamented with beads (2879). Presented by Chief Constable Thos. Parsons.

Knife with wooden handle (2880). Used for barking trees. Presented by Chief Constable Thos. Parsons.

Moccasins, rawhide (2881). Presented by Chief Constable Thos. Parsons.

Illustrations, Archæology of British Columbia.

Plate I., Fig. 1. Stone pile-driver (2891). Size, 22 x 4½ x 4½ inches. Weight, 23½ lb. Three specimens of this type were obtained at Seton Lake in 1916, and with the exception of a few specimens in the collection of W. H. Keary, Esq., of New Westminster, none others have been observed. So far as known, no such implements have been either described or illustrated and no reference is made to them in the report on the Lillooet Indians by the well-known writer, Mr. J. A. Teit, of Spences Bridge.

Plate I., Fig. 2. Carved stone baton. Size, 13¼ x 2 inches. Collected at Hoquelget, Bulkley River, in 1897, and presented to C. F. Newcombe by A. T. Vowell, Esq., Indian Superintendent for British Columbia. The specimen was found with many others some feet below the surface of the ground when digging over the foundation of an old house by Chief Johnny Muldoe.

Several of the batons were of hard stone and not carved, and these were suitable for use as weapons. Others, like that figured, were of sandstone, deeply carved and perforated, and were too brittle, both as to material and make, to be serviceable as weapons.

The tradition obtained from Indians says that these were last used by the Gitanmax or Hazelton band of Tsimshians nearly a hundred years ago when fighting with the Kitsegukla band in alliance with the Kit-ksuns of the Upper Skeena.

The Gitanmax were nearly wiped out, but their weapons and insignia were collected after the battle by an old woman who cached them where they were found by the Babine chief mentioned.

Several similar batons are in the Victoria Memorial Museum, Ottawa, from Metlakatla. This type of batons has not hitherto been described or illustrated so far as known.

Plate II., Fig. 1. Stone implement (1801/557). Size, 6½ x 5½ inches. Of mica-schist. This specimen is shaped somewhat like the bone-bark choppers of certain Coast tribes or some of the fish-knives, having a straight upper edge and a curved lower one. It is, however, much thicker than either of these and the edge is blunt. Three similar specimens were collected in an old kitchen-midden on Digby Island, near Prince Rupert, together with a great number of bone and stone objects, and another has been in the Provincial Museum since 1889. This was collected at Port Simpson by Mr. W. B. Anderson and is numbered 753. No information as to history and use could be obtained from the Tsimshian people.

Plate II., Fig. 2. Stone implement (1793/232). Size, 3½ x 1⅛ inches. Of porous sandstone, with numerous deep grooves. This is one of a few similar specimens found in the kitchen-midden at Digby Island, already referred to. No information as to use obtained from Indians. It is suggested that it might have served as a scraper for the gut used for bow-strings and other purposes.

Plate II., Fig. 3. Stone hand-hammer (1736/561). Size, 7 x 4 x 1¾ inches. Weight, 4½ lb. Of tough igneous rock, rounded oblong, narrow at the ends, each of which has two shallow grooves. There are two flattened striking surfaces parallel to each other.

In the Museum, collected from the kitchen-midden at Digby Island, there is a series of sixteen stones of similar size and shape, ranging from the natural smooth, water-worn pebble to the fully manufactured object. The series shows intermediate stages of manufacture beginning with shallow grooves made by battering the natural pebble with another hard stone.

Some of the set are very symmetrical and pointed at each end. Others are squared off narrowed ends and one circular shallow pit on each flattened side, in this respect resembling hammer stones found in shell mounds near Victoria.

The range of this implement is not confined to the Tsimshian country, as two similar specimens were collected by Dr. Newcombe at Masset, Q.C.I., where they had been found by Indians when digging up old house-sites.

BARE ISLAND BIRD SANCTUARY.

The Director arranged with Duncan C. Scott, Deputy Superintendent-General of Indian Affairs, Ottawa, to again give the Provincial Museum authority to place a guard on Bare Island during the nesting season of 1916. (This island is known as Indian Reserve No. 9, Saanich Tribe, and is situated in Haro Strait about twenty miles north-east of Victoria.)

Mr. W. B. Anderson was again appointed warden, he being an ardent lover of nature, and much interested in the preservation of "wild life." I do not think the Government could have engaged a more competent person to take charge of the sanctuary. Mr. Anderson remained on the island from the middle of June until the end of July continuously. The Director made several trips to Bare Island during the nesting period, and it was very gratifying to note the benefit that had resulted in protecting this island for the last two seasons; the breeding glaucous-winged gulls (*Larus glaucescens*) have about doubled in number. The pigeon guillemots (*Cepphus columba*) have increased, but not so great in numbers as the gulls: "and it is to be hoped that as the rabbits get killed off that had been turned out on the island several years ago," that the guillemots will again be able to return, and take up their old nesting-places under the broken rocks and in the deep crevices. The violet-green cormorants (*Phalacrocorax p. robustus*) have increased in considerable numbers, as is to be noted by a visit to the high cliffs on the western side of the island, where these birds build their nests. The tufted puffins (*Lunda cirrhata*) do not seem to be returning, as only about four pairs were observed, they having also been driven out of their deep burrows by rabbits.

The guard was pleased to report that the Indians did not go to the island this last season to gather camas, also that the birds had not been disturbed during the incubation period, and that no other persons had been allowed to land on the island, other than those who had been given a special permit from the Director.

Many thanks are due to W. E. Ditchburn, Inspector of Indian Affairs for British Columbia, who gave Mr. Anderson a letter giving him protection, and a warning to any person or persons interfering with him in the discharging of his duties.

REPORT ON FIELD-WORK IN OKANAGAN AND SHUSWAP DISTRICTS, 1916.

By J. A. MUNRO.

Biological investigations in the Okanagan and Shuswap Districts were continued during the season of 1916, from April 20th to October 31st. Several months were spent in the vicinity of Okanagan Landing, enlarging the collections and adding to the field-notes commenced last season. A résumé of the topographical and forest conditions of this district was published in the field report for 1915. Collecting trips were made to the following points:—

NAHUN PLATEAU.

Three camps were made on the Nahun Plateau. This plateau is on the west side of Okanagan Lake, twenty miles south of Okanagan Landing. The highest point is at the eastern end, where the altitude is 3,200 feet. Field operations were confined to this portion, where the fauna and flora is typically Canadian. A considerable quantity of zonal notes and data relating to the distribution and breeding habits of some of the rarer species of birds were obtained.

The principal trees are Murray pine (*Pinus murrayana*) and western larch (*Larix occidentalis*), with small stands of western red cedar (*Thuja plicata*) and clumps of Engelmann's spruce (*Picea engelmanni*) in the bottoms.

The valley slopes gradually south-west to Bear Creek. As the altitude decreases zonal characters become less sharply defined. The Murray pine and western larch give way to yellow pine, which gradually becomes the prevailing tree. With the appearance of yellow pine there is a corresponding infusion of transitional faunal forms.

Swan Lake.

Several trips were made to Swan Lake. This is a shallow alkaline lake, about four miles long and half a mile wide, lying immediately north of the North Arm of Okanagan Lake. The shores are muddy and grown up with tules, rushes, and sedges. The rich bottom land is under cultivation as close to the water as possible, but sufficient cover to make the shores an attractive breeding-ground for birds is afforded by dense patches of second growth, chiefly aspen (*Populus tremuloides*), mountain-birch (*Betula fontinalis*), willow (*Salix sp.*), and alder (*Alnus sp.*).

The following species of birds were breeding:—

Holbœll's Grebe (*Colymbus holbœlli*).
Horned Grebe (*Colymbus auritus*).
Loon (*Gavia immer*).
Black Tern (*Hydrochelidon nigra surinamensis*).
Mallard (*Anas platyrhynchos*).
Redhead (*Marila americana*).
Ruddy Duck (*Erismatura jamaicensis*).
Bittern (*Botaurus lentiginosus*).
Coot (*Fulica americana*).
Spotted Sandpiper (*Actitis macularia*).
Killdeer (*Oxyechus vociferus*).
Marsh Hawk (*Circus hudsonius*).
Osprey (*Pandion haliaetus carolinensis*).
Short-eared Owl (*Asio flammeus*).
Western Belted Kingfisher (*Ceryle alcyon caurina*).
Red-naped Sapsucker (*Sphyrapicus varius nuchalis*).
Kingbird (*Tyrannus tyrannus*).
Western Wood Pewee (*Myiochanes richardsoni richardsoni*).
Alder Flycatcher (*Empidonax trailli alnorum*).
Magpie (*Pica pica hudsonia*).
Western Crow (*Corvus brachyrhynchos hesperis*).
Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*).
Northwestern Redwing (*Agelaius phœniceus caurinus*).
Western Meadowlark (*Sturnella neglecta*).
Bullock's Oriole (*Icterus bullocki*).
Brewer's Blackbird (*Euphagus cyanocephalus*).
Pale Goldfinch (*Astragalinus tristis pallidus*).
Western Vesper Sparrow (*Poœcetes gramineus confinis*).
Western Chipping Sparrow (*Spizella passerina arizonæ*).
Sooty Song Sparrow (*Melospiza melodia rufina*).
Spurred Towhee (*Pipilo maculatus montanus*).
Lazuli Bunting (*Passerina amœna*).
Cedar Waxwing (*Bombycilla cedrorum*).
Red-eyed Vireo (*Vireosylva olivacea*).
California Yellow Warbler (*Dendroica æstiva brewsteri*).
Pacific Yellow-throat (*Geothlypis trichas arizela*).
Catbird (*Dumetella carolinensis*).
Western Marsh Wren (*Telmatodytes palustris plesius*).
Chickadee (*Penthestes atricapillus atricapillus*).
Willow thrush (*Hylocichla fuscescens salicicola*).
Western Robin (*Planesticus migratorius propinquus*).
Mountain Bluebird (*Sialia currucoides*).

Shuswap District.

The Shuswap District was visited in the early part of June and again in the latter part of October. Board was obtained at a ranch near Shuswap Falls. This proved much more satisfactory than establishing a camp, as more time could be given to the collecting and preparing of specimens.

Although only slightly higher than the Okanagan, biological conditions are quite different. On the mountain-slopes the fauna and flora are distinctively Canadian. The principal trees are western white pine (*Pinus monticola*), Murray pine (*Pinus murrayana*), western larch (*Larix occidentalis*), Engelmann's spruce (*Picea engelmanni*), and western hemlock (*Tsuga heterophylla*).

Conditions in the wide bottoms show a surprising resemblance to the humid Coast belt. Western red cedar (*Thuja plicata*) is the prevailing tree, varied by clumps of giant black cottonwood (*Populus trichocarpa*). The black-headed grosbeak (*Zamelodia melanocephala*), a characteristic Coast bird, is a regular summer resident.

Bird-life in these coniferous forests is not plentiful either in number of species or individuals. The following species could be called common and were undoubtedly all breeding:—

Spotted Sandpiper (*Actitis macularia*).
Western Redtail (*Buteo borealis calurus*).
Dusky Horned Owl (*Bubo virginianus saturatus*).
Pygmy Owl (*Glaucidium gnoma gnoma*).
Rocky Mountain Hairy Woodpecker (*Dryobates villosus monticola*).
Red-naped Sapsucker (*Sphyrapicus varius nuchalis*).
Northern Pileated Woodpecker (*Phlœotomus pileatus abieticola*).
Alaska Three-toed Woodpecker (*Picoides americanus fasciatus*).
Nighthawk (*Chordeiles virginianus virginianus*).
Kingbird (*Tyrannus tyrannus*).
Western Wood Pewee (*Myiochanes richardsoni richardsoni*).
Wright's Flycatcher (*Empidonax wrighti*).
Olive-sided Flycatcher (*Nuttallornis borealis*).
Magpie (*Pica pica hudsonia*).
Black-headed Jay (*Cyanocetta stelleri annectens*).
Pine Siskin (*Spinus pinus*).
Western Chipping Sparrow (*Spizella socialis arizonæ*).
Sooty Song Sparrow (*Melospiza melodia rufina*).
Spurred Towhee (*Pipilo maculatus montanus*).
Western Tanager (*Piranga ludoviciana*).
Tree Swallow (*Iridoprocne bicolor*).
Bank Swallow (*Riparia riparia*).
Red-eyed Vireo (*Vireosylva olivacea*).
Calaveras Warbler (*Vermivora rubricapilla gutturalis*).
Audubon's Warbler (*Dendroica auduboni auduboni*).
Redstart (*Setophaga ruticilla*).
Rocky Mountain Creeper (*Certhia familiaris montana*).
Red-breasted Nuthatch (*Sitta canadensis*).
Chickadee (*Penthestes atricapillus atricapillus*).
Mountain Chickadee (*Penthestes gambeli gambeli*).
Willow Thrush (*Hylocichla fuscescens salicicola*).
Olive-backed Thrush (*Hylocichla ustulata swainsoni*).
Western Robin (*Planesticus migratorius propinquus*).
Mountain Bluebird (*Sialia currucoides*).

KETTLE RIVER DISTRICT.

Through the courtesy of Mr. George P. Melrose, of the Forest Branch, the writer was enabled to accompany a timber-cruising party to the Kettle River Divide.

The party left Okanagan Landing for Penticton on September 25th, and reached Myra, on the Kettle River Railway, at noon of the next day. Camp was made close to the railway near Canyon Creek. Daily trips were made into the heavy forest on the north slope of Little White Mountain until October 1st, when the party returned to Vernon.

Conditions where field-work was conducted may be described as follows: A dense coniferous forest, sloping gradually east to the base of Little White Mountain and at a maximum altitude of 5,000 feet. The principal trees are Engelmann's spruce (*Picea engelmanni*), which greatly outnumbered the other species; balsam fir (*Abies lasiocarpa*); and Murray pine (*Pinus murray-*

ana). There was no undergrowth, but the fallen timber made travelling impracticable off the one trail. Owing to the lateness of the season no insects or plants were collected. The weather was cold and stormy and 2 inches of snow fell. A small collection of mammals, principally voles of the genus *Microtis*, was taken, and specimens of the following species of birds:—

Franklin's Grouse (*Canachites franklini*).
Gray Ruffed Grouse (*Bonasa umbellus umbelloides*).
Alaskan Three-toed Woodpecker (*Picoides americanus fasciatus*).
Rocky Mountain Jay (*Perisoreus canadensis capitalis*).
Lincoln Sparrow (*Melospiza lincolni lincolni*).
Rocky Mountain Pine Grosbeak (*Pinicola enucleator montana*).
Columbian Chickadee (*Penthestes hudsonicus columbianus*).
Mountain Chickadee (*Penthestes gambeli gambeli*).
Varied Thrush (*Ixoreus nævius nævius*).
Goshawk (*Astur atricapillus atricapillus*).

Richardson's Grouse (*Dendragapus obscurus richardsoni*) and Northern Raven (*Corvus corax principalis*) were seen, but none were secured.

During the early part of the summer and in the autumn the trapping of small mammals was systematically pursued, at varying altitudes, in every locality visited. The results were particularly gratifying. Series of several species of the genus *Microtis*, hitherto unrepresented in the Provincial collection, were taken; also large series of the following mice, voles, and shrews: *Evotomys gaperi*, *Microtis mordax*, *Microtis drummondi*, *Microtis nanus canescens*, *Perognathus lordi*, *Peromyscus maniculatus artemisiae*, *Sorex obscurus*, *Sorex personatus*, and many others which have not yet been classified. Altogether 290 specimens were preserved, a detailed report of which is being prepared.

While a general collection of zoological material was attempted, particular attention was directed to the gathering of ornithological material and data. A check-list that will serve as a basis for future investigation is in the course of preparation. To determine the specific standing of the more mutable forms a considerable series of skins is required. The writer is pleased to report that a collection of the breeding species is now fairly complete for this locality. The series of each species includes breeding birds of both sexes, moulting adults and juvenals of both sexes in their various plumages.

Nests and eggs of the following species were taken:—

Holbœll's Grebe (*Colymbus holbœlli*).
Horned Grebe (*Colymbus auritus*).
Black Tern (*Hydrochelidon nigra surinamensis*).
Redhead (*Marila americana*).
Barrow's Golden-eye (*Clangula islandica*).
Richardson's Grouse (*Dendragopus obscurus richardsoni*).
Marsh Hawk (*Circus hudsonius*).
Nighthawk (*Chordeiles virginianus virginianus*).
Calliope Hummingbird (*Stellula calliope*).
Western Wood Pewee (*Myochanes richardsoni richardsoni*).
Alder Flycatcher (*Empidonax trailli alnorum*).
Magpie (*Pica pica hudsonia*).
Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*).
North-western Redwing (*Agelaius phœniceus caurinus*).
Western Meadowlark (*Sturnella neglecta*).
Brewer's Blackbird (*Euphagus cyanocephalus*).
Sooty Song Sparrow (*Melospiza melodia merrilli*).
Spurred Towhee (*Pipilo maculatus montanus*).
Lazuli Bunting (*Passerina amœna*).
Western Marsh Wren (*Telmatodytes palustris plesius*).
Redbreasted Nuthatch (*Sitta canadensis*).
Willow Thrush (*Hylocichla fuscescens salicicola*).
Olive-backed Thrush (*Hylocichla ustulata swainsoni*).
Western Bluebird (*Sialia mexicana occidentalis*).
Mountain Bluebird (*Sialia currucoides*).

The collection for the season numbered approximately as follows: 290 mammals, 528 birds, 1,118 insects, 10 reptiles and batrachians, 300 plants, 35 fishes, 40 sets of birds' eggs.

The writer wishes to take this opportunity of expressing his thanks to Mr. George Heggie, of Vernon, for permission to shoot over the property of the Land and Agricultural Company; to Mr. B. Thorlacson; Mr. William Johnstone and Mr. H. R. Hanna, of the Commonage, for a similar privilege; and to Mr. George N. Gartrell, Deputy Game Warden, of Summerland, for his valuable assistance in securing certain specimens.

Some of the ornithological notes made during the past two years are as follows:—

HOLBŒLL'S GREBE (*Colymbus holbœlli*).

Found breeding commonly at Swan Lake on May 18th and June 8th, 1916. Twenty nests were found and three sets of fresh eggs were taken. The nests were composed of dead rotting vegetation, held in place by growing rushes, and floating, half-submerged, in water from 2 to 4 feet in depth. In some cases the eggs were partly or wholly covered when found, but usually were exposed. When a nest was visited both birds of the pair swam up and down in the open water 20 or 30 yards beyond the nest, showing no signs of alarm. A peculiar fact noted was that near every nest, generally within a few yards, there was invariably a coot's nest.

RED-THROATED LOON (*Gavia stellata*).

A juvenal female picked up dead on the shore of Okanagan Lake on November 22nd, 1915, is the first record of this species in the Okanagan. The body was in a very emaciated condition and the stomach and digestive tract empty and contracted.

EARED GREBE (*Colymbus nigricollis californicus*).

This species was first recorded from the Okanagan by Major Allan Brooks on April 17th, 1914. Another individual was seen by the writer two weeks later and was again noted on May 27th, 1915.

BLACK TERN (*Hydrochelidon nigra surinamensis*).

Usually a scarce, irregular migrant. On May 18th, 1916, a breeding colony of twenty pairs (estimated) was observed at Swan Lake. On June 8th three sets of fresh eggs were taken. The nests consisted of a few pieces of water-soaked rushes or other aquatic plants, resting on the floating mass of dead tules that had drifted against the outer fringe of marsh. This bed of flotsam, anchored securely to the growing tules and rising and falling on the waves, without wetting its upper surface, formed an ideal nesting-place. While hunting for the nests, breast-deep in mud and water, the terns kept flying about in restless excitement, often within arm's length.

BLUE-WINGED TEAL (*Querquedula discors*).

Once fairly common throughout the Interior of British Columbia, this species has been of rare occurrence in the Okanagan during the past ten years. Five individuals were seen during May, 1915, and three of them secured.

CINNAMON TEAL (*Querquedula cyanoptera*).

Rare summer resident. Five were seen at Swan Lake on May 18th, 1916.

REDHEAD (*Marila americana*).

Found breeding at Swan Lake. On June 8th a nest with four fresh eggs was taken on the side of a musk-rat house. The hollow containing the eggs was well lined with dry tules, but as the female had not laid her complement of eggs, no down had been added. This is the commonest duck on Okanagan Lake during the winter; large flocks gather in the shallow water at the north end of the lake, reaching the maximum number about February 15th.

BARROW'S GOLDEN-EYE (*Clangula islandica*).

A common summer resident. A series of skins collected includes an adult male and half-grown and immature birds of both sexes. Usually for a nesting-site this species selects an old woodpecker's hole that has become enlarged by decay, and generally in a tree close to the shore of a small lake. On May 12th, 1916, a nest containing eleven fresh eggs was found in the hay-loft of a log barn built on the shore of an alkaline lake. The nest was concealed in the hay under one of the big cross-beams. The loft was open in many places between the logs; there was also a large opening at the end of the building, and through this the female visited the nest.

BUFFLE-HEAD (*Charitonetta albeola*).

A common resident. A set of ten partly incubated eggs was taken on May 22nd, 1915. The nest was in an old flicker's hole, 40 feet from the ground, at the top of a dead Douglas fir on the shore of a small alkaline lake. The cavity was much enlarged by decay, and at a touch the whole side pulled away and exposed the eggs in their bed of down. The same nest had evidently been used for several years, as there were fragments of old shells in the bottom of the hole and mixed through the down.

LONG-BILLED DOWITCHER (*Macrorhamphus griseus scolopaceus*).

An adult male in summer plumage taken on July 30th, 1915, and two immature males taken on September 9th, 1916, are the only Okanagan records.

LEAST SANDPIPER (*Pisobia minutilla*).

Common fall migrant. None observed during spring migrations until May 6th, 1916, when five were seen. A few seen daily until May 11th.

YELLOW-LEGS (*Totanus flavipes*).

Common fall migrant. None observed during spring migrations until May 6th, 1916, when one was seen which remained in the vicinity until May 11th.

RICHARDSON'S GROUSE (*Dendragapus obscurus richardsoni*).

On May 3rd, 1916, a nest containing ten fresh eggs was found under an old rail fence. The nest was a shallow depression in the ground 8 inches in diameter and 5 inches deep, well lined with pine-needles and grouse-feathers. A nest with seven partly incubated eggs was found in a similar situation on May 13th, 1915.

MARSH HAWK (*Circus hudsonius*).

Two pair found breeding at Swan Lake. Nest and eggs taken on May 15th and May 18th. The nests were loosely constructed of sticks, weed-stalks, and dry grass, built in the marsh 20 yards from shore. The tules had been beaten down for a distance of 3 feet around the nest, forming a small clearing in the marsh.

GOSHAWK (*Astur atricapillus atricapillus*).

All specimens taken here appear to be referable to this form. Both adults and young are much paler than examples of *striatulus* from the Coast.

PYGMY OWL (*Glaucidium gnoma gnoma*).

Common summer resident, more plentiful in the region of Murray pine and larch. A nest containing seven downy young was found in a deserted woodpecker hole, 30 feet from the ground, in a dead larch, on June 9th, 1915.

ARCTIC THREE-TOED WOODPECKER (*Picoides arcticus*).

Resident in the Canadian Zone. Less common than *fasciatus*. A breeding female was taken on the Nahun Plateau on May 30th, 1916.

ALASKA THREE-TOED WOODPECKER (*Picoides americanus fasciatus*).

A common resident in the Canadian Zone, preferring the burnt areas of spruce and larch. Taken on the Nahun Plateau, at Shuswap Falls, and Little White Mountain. A juvenal male collected at Shuswap Falls on June 17th showed the yellow crown patch, but more restricted than in the adult male.

OLIVE-SIDED FLYCATCHER (*Nuttallornis borealis*).

A common summer resident in the Canadian Zone. Taken on the Nahun Plateau and at Shuswap Falls.

YELLOW-HEADED BLACKBIRD (*Xanthocephalus xanthocephalus*).

Several breeding colonies found at Swan Lake, the only locality in this region where the writer has found them breeding. An example of how very local some species are in mountainous countries: On May 15th a number of incompleted nests were found, and on June 8th four sets of eggs were taken. The nests are more loosely constructed than those of the North-western Redwing, and are lined with flat pieces of tule fibre. Those of the North-western Redwing are lined with coarse grass. Nests of both species were found close together and they made common cause in driving away crows, marsh hawks, and other marauders from the vicinity of the nests. In common with other blackbirds, the males of this species have the habit, when uttering their harsh grating song, of elevating the shoulders and erecting the feathers until the singer appears twice his natural size.

WESTERN GRASSHOPPER SPARROW (*Ammodramus savannarum bimaculatus*).

This handsome, unobtrusive little sparrow is common locally breeding on the dry, open hillsides above Vernon. They arrive early in May and remain until the second week in October; one of the last sparrows to leave in the fall. Contrary to the published accounts of this bird's habits, it is the writer's experience that the males generally sing while on the ground or hidden in a thick clump of sage-brush. On only two occasions has the writer heard it singing while clinging to a weed-stalk or bush in full view. A series of skins collected includes breeding males, moulting adults, and juvenals.

SLATE-COLOURED JUNCO (*Junco hyemalis hyemalis*); SHUFELDT'S JUNCO (*Junco hyemalis connectens*); MONTANA JUNCO (*Junco hyemalis montanus*).

These three subspecies occur here as migrants; also another form, evidently intermediate between *oreganus* and *connectens*. The breeding form has not yet been determined.

BLACK-HEADED GROSBEAK (*Zamelodia melanocephala*).

An adult male taken on August 24th, 1916, is the only local record. Major Allan Brooks found the species breeding in the Shuswap District, but it was not observed by the writer.

TOWNSEND'S WARBLER (*Dendroica townsendi*).

Of regular occurrence during migrations at Okanagan Landing; also taken on the Nahun Plateau on May 30th, where it appeared to be common.

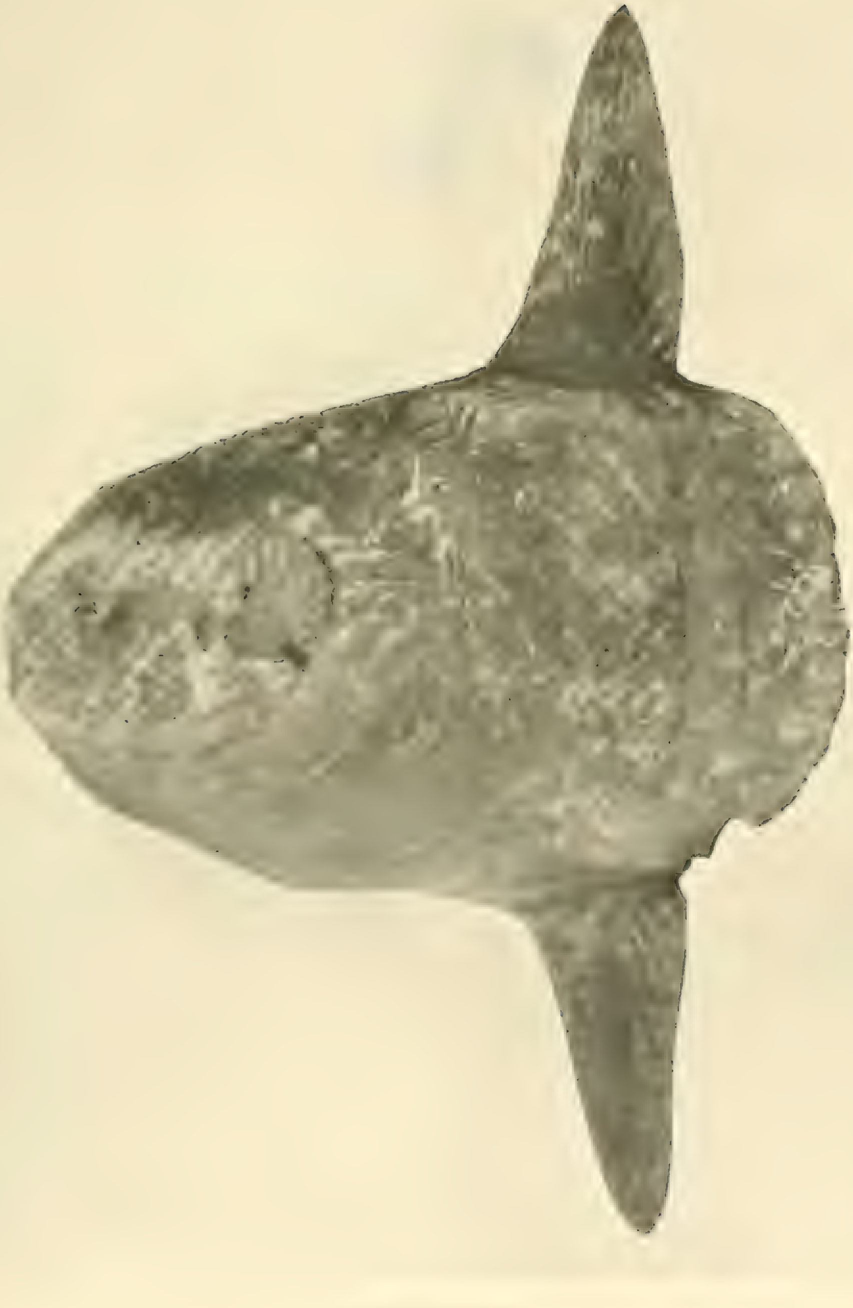
FISHES.

Early in the month of June the Director drew the attention of Dr. C. H. Gilbert, of Stanford University (who was visiting the Museum), to a strange fish that had been caught and presented to the Museum by the Bentinck Island fishermen, near Race Rocks, Strait of Juan de Fuca, about ten miles south of Victoria. Dr. Gilbert noticed at once that the specimen was one that he had never seen in this portion of the Pacific, and identified it as a species of *Benthodesmus;* also suggesting that I send it to him at Stanford University, along with other fishes, which he would be pleased to examine and identify for this Department upon his return to California. The extract from his letter of November 27th, 1916, is here quoted:—

"The long silvery fish which you showed me last summer turns out to be a *Benthodesmus,* as we thought at the time. There are three other species of this genus known—one from New Zealand, one from Japan, and one from the Atlantic; each of these is known from a single specimen. A careful comparison with the brief description indicates that your specimen cannot be identified with either of the known species from the Pacific, but the differences from the Atlantic species are so small in amount that I do not care to risk describing it as a distinct species. This is the more unfortunate that the Atlantic species has received the name 'atlanticus.'"

PLATE III.

Benthodesmus atlanticus. Specimen in Provincial Museum, Victoria, B.C.



Sunfish (*Mola mola*).

NOTE.—The United States National Museum, Washington, have accepted for publication the notes prepared by Dr. C. H. Gilbert, announcing the discovery of this interesting species *Benthodesmus* in the Pacific.

The *Benthodesmus atlanticus* is uniform silvery in colour throughout, with traces of dark colour on the head and tail—length, 41½ inches—and was caught by fishermen fishing for cod near Victoria on May 30th, 1916. (F. K.)

"The only other known specimen was taken from the stomach of a halibut caught on the western edge of the Grand Bank of Newfoundland in 80 fathoms." (Goode & Bean.) (*See* Plate III.)

ON THE OCCURRENCE OF *BENTHODESMUS ATLANTICUS* (GOODE & BEAN) ON THE COAST OF BRITISH COLUMBIA.

BY DR. C. H. GILBERT, PROFESSOR OF ZOOLOGY, STANDARD UNIVERSITY, CAL.

A specimen of *Benthodesmus*, 41½ inches long, was obtained on May 30th, 1916, from a fish-dealer in Victoria, B.C., having been caught by fishermen off Bentinck Island, which lies near Race Rocks, about ten miles by water from Victoria. The specimen is the property of the Provincial Museum of Victoria, and has been submitted to us for identification by Mr. F. Kermode, the Director of the Museum.

Description: Greatest width of body, 2⅔ in height at vent. Length of caudal peduncle, half greatest height of body. Least height of tail, ⅓ bony interorbital width. Greatest width of head, ⅙ its length. Greatest height of head, 3¾ in its length. Width of interorbital area (bony), ¼ height of head. Length of snout, 2¼ in head. Tip of maxillary not reaching the orbit, the length of maxillary equalling the postorbital part of head. Length of lower jaw, 1⅞ times greatest height of body. Flexible part of mandibular tip short in the preserved specimen, about ¼ diameter of orbit. Eye postmedian, 5⅓ in head, 2⅓ in length of snout.

Sides of maxillary with nine or ten triangular teeth, which decrease from middle of sides of jaw both forwards and backwards. Two pairs of narrow compressed fangs in the anterior part of the upper jaw, the anterior pair immediately behind the tip, the posterior pair separated by a considerable interspace, but located in front of the series of compressed lateral teeth already described. In advance of the most anterior of the compressed lateral teeth a series of six or seven short slender conical teeth continued forwards to the anterior pair of fangs and passing outside the posterior pair of fangs. Side of mandible with fourteen or fifteen compressed triangular teeth in a single series, decreasing in length forwards, and inclined slightly towards the front of the jaw. In advance of these, on each side of the symphysis, are two pairs of short retrorsely directed teeth, the anterior pair much shorter than the posterior pair. Other bones of the mouth toothless.

First gill-arch with four or five or seven or eight slender short distant rakers, the longest about 2 mm. in length. Each rise from a plate which bears short spines, and between each pair of these plates, on the outer surface of the arch, are interposed two similar smaller plates which do not bear rakers. The rakers are borne only on the posterior third of the horizontal limb of the arch, but the spinous plates are continued farther forwards, and become merged along the anterior part of the arch in a narrow spinous strip. The other arches are similar to the first, but contain fewer free rakers. The upper pharyngeals are well toothed and work against the spinous plates on the horizontal limbs of the arches.

First dorsal ray slightly in advance of the middle of the operculum, the front of the orbit midway between the first ray and the tip of the snout. There are 142 rays in all, the posterior the longest. The rays rise from the anterior ends of a series of interneural bones which form a sharp ridge along the dorsal profile.

The vent is beneath the 46th dorsal ray, its distance from the tip of the snout 3⅐ times the length of the head. Distance from vent to postanal scute, ⅚ diameter of orbit. Immediately behind the scute begins a series of eighty-eight interhæmals, which forms a continuous sharp ridge along the lower profile. The anterior ones bear no rays, but these gradually appear posteriorly, about forty of the posterior plates bearing evident free rays, which increase in length posteriorly.

The pectorals contain twelve rays, the lower distinctly the longest, equalling the postorbital length of the head. Ventrals mutilated, their base posterior to that of pectoral by ⅖ diameter of orbit. Caudal deeply forked, its longest ray equalling the diameter of the orbit. Color silvery, becoming posteriorly steel-grey, and finally black. Lips black, as are also the inside of the mouth and the gill-cavity, including the gill-arches. Peritoneum also black.

One specimen, 41⅛ inches long, the property of the Provincial Museum of British Columbia.

Benthodesmus elongatus (Clarke) from New Zealand differs notably from this species in the much more elongate form, the depth scarcely exceeding one-fortieth of the length. The third species of the genus *B. tenuis* (Guenther) from Japanese waters has much shorter vertical fins, the dorsal having but 126 rays and the anal but 71 rays. The specimen in hand differs in only minor respects from the description of *B. atlanticus* given by Goode & Bean. The width of the body is slightly greater, 2⅔ in its height; the snout slightly longer, its 2¼ in the head; the mandibular tip shorter, ¼ the orbit; the eye smaller, 2⅓ in the snout. And there are four long teeth in the upper jaw, instead of three. The species has been known hitherto from a single specimen.—*Smithsonian Miscellaneous Collections, Vol. 66, No. 18.*

In addition to the record in last year's report, there has been a second occurrence of the sunfish (*Mola mola*) in British Columbia waters. The specimen was caught by an Indian, Charles Stewart, off the coast of Princess Royal Island (which is about 450 miles north of where the first specimen was secured on Barkley Sound, V.I.); the second specimen was also secured and forwarded to the Museum by Mr. N. E. Wheeling, Butedale Cannery, at Butedale, B.C.

The sunfish in colour is a dark grey; sides greyish-brown, with silvery reflections; belly dusky; a broad blackish bar running along bases of dorsal, caudal, and anal fins. Pelagic, inhabiting most temperate and tropical seas, swimming slowly about near the surface, the high dorsal above the surface. (*See* Plate IV.)

The following is a list of species of fishes which the Director sent to Dr. Gilbert for identification:—

Two species of whitefish, *Coregonus quadrilateralis* and *Leucichthys pusillus*, collected by F. Kermode in Atlin Lake, September 29th, 1913; Menominee whitefish (*Coregonus quadrilateralis*), sent from Carcross, Yukon, by W. T. Townsend; *Mylochilus caurinus*, *Ptychocheilus oregonensis*, *Coregonus williamsoni*, collected by J. A. Munro, Okanagan Lake; *Leuciscus richardsoni*, *Ptychocheilus oregonensis*, *Cottus asper*, *Salmo gairdneri*, *Rhinichthys cataractæ*, collected near Hanceville by W. A. Newcombe; *Salvelinus malma*, collected at Edgewood, Lower Arrow Lakes, by G. E. T. Pittendright; *Salmo gairdneri*, *Salmo mykiss*, collected by W. R. Carter, Deputy Game Warden, Alberni.

Giant bass (*Erilepis zonifer*). This fish was presented to the Museum by A. L. Hager, manager of the Canadian Fishing Company, Vancouver, who also kindly gave permission to reproduce the accompanying photograph, which gives the comparison of its great size.

The *Erilepis* weighed when taken from the water 159 lb.; measured 5 feet 9½ inches in length and 19 inches in depth; was caught on halibut gear, the hooks being bated with herring, in 200 fathoms of water off the west coast of Queen Charlotte Islands, fifteen miles from Tasu, by the Canadian Fishing Company's schooner "Borealis," Captain Chris. Johnson. (*See* Plates V., VI.)

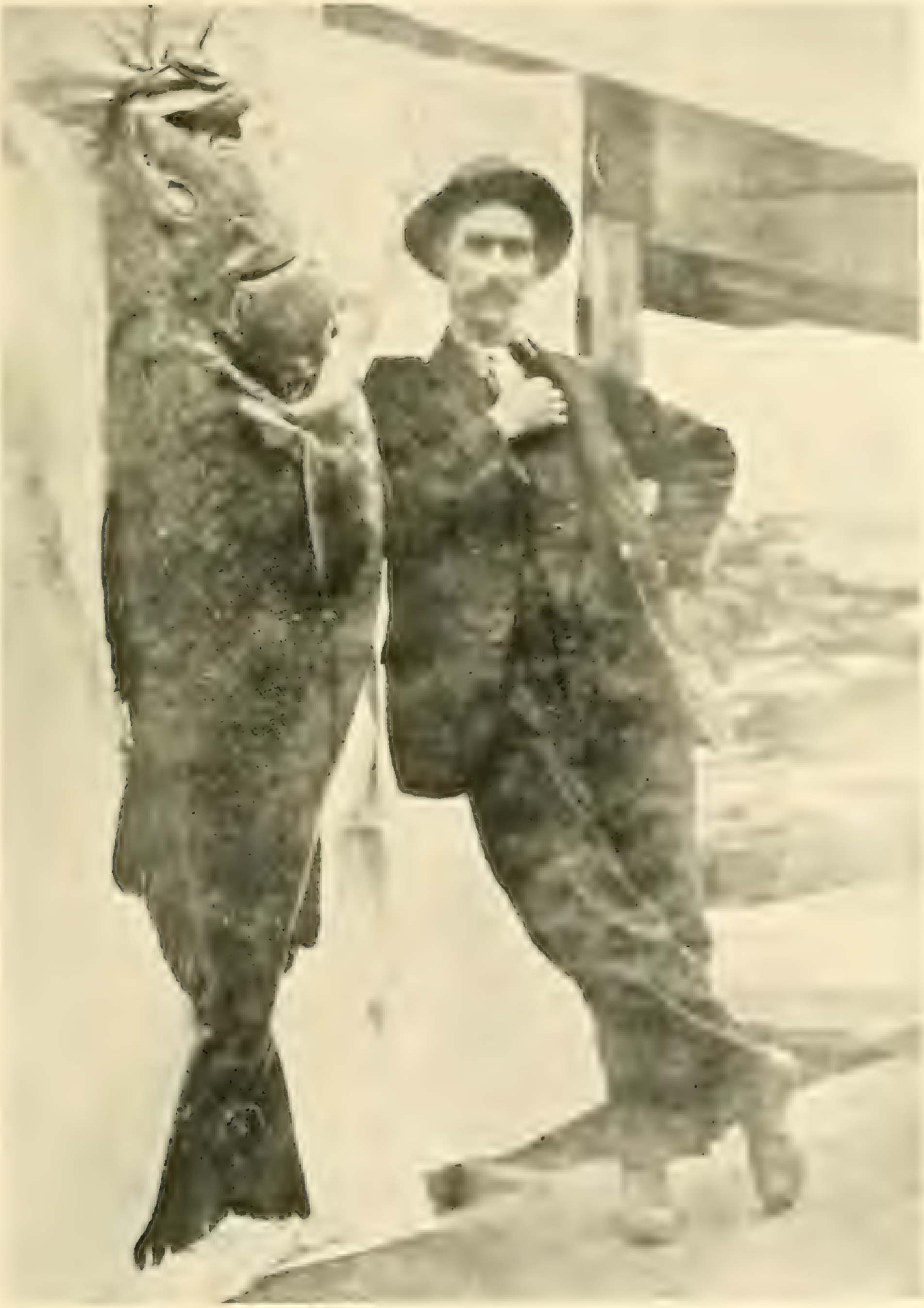
FURTHER NOTES ON *ERILEPIS*, THE GIANT BASS-LIKE FISH OF THE NORTH PACIFIC.

By WILLIAM F. THOMPSON, OF STANFORD UNIVERSITY.

In Copeia for April 24th, 1916 (No. 30), the writer noted the second occurrence of *Erilepis zonifer* (Lockington) in the North Pacific. Since then several interesting facts have come to light concerning this huge fish that have modified what was previously said. It is especially noteworthy that there is no special reason for believing the fish a stray from Japan, as has been conjectured.

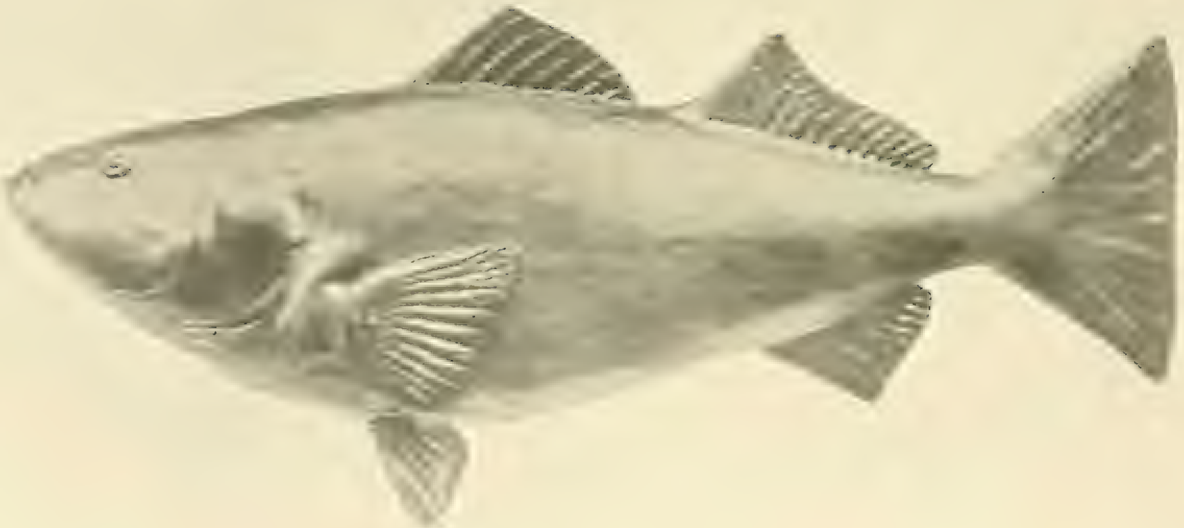
According to one of the fishermen, the specimen already recorded has been taken in South-eastern Alaska, in one of the long inland straits which form the inland passage, either in Frederick Sound or Chatham Strait: The captain of the halibut-schooner, when seen at a later date, stated positively that the specimen was taken off the western coast of the Queen

PLATE V



Giant Bass (*Erilepis zonifer*). Weight, 159 lb., and measured 5 feet 9½ inches

PLATE VI



Giant Bass (*Erilepis zonifer*). From a cast in Provincial Museum, Victoria, B.C.

Charlottes, near the northern end. His record is undoubtedly correct, and it is evident that *Erilepis* was taken on the continental shelf, rather than in enclosed waters.

While in Vancouver during November, at the plant of the Canadian Fishing Company, the writer was shown two other specimens of this fish.

Under the heading of "A Freak Fish," a statement with a photograph of the larger was given in the *Pacific Fisherman* for November, as follows:—

While the halibut-schooner "Borealis" was fishing with halibut-trawls in 240 fathoms of water in Rennel Sound, on the west coast of Queen Charlotte Island, British Columbia, during October, a fish which weighed, in the round, 175 lb., and when dressed 145 lb., was caught. It measured 5 feet 10 inches in length. The opinion was expressed that it was "a large sea-bass" from Southern Pacific waters. Through the kindness of the company manager a smaller specimen caught at the same time was sent to Stanford University in a frozen condition. There it has been carefully examined and compared with a Japanese specimen, undoubtedly the same species.

It will be noted that the locality was the same as the corrected one for the first specimen. The probability is that there is an available explanation for the occurrence. In the region indicated the continental shelf drops with great rapidity to oceanic depths, and a halibut-trawl set in 150 fathoms on its shoreward end frequently drops as far as its buoys will allow it on the seaward end. This may be as much as 400 fathoms. It has only been in recent years, particularly in the winter, that halibut-fishing has been carried on in depths of 140 fathoms and more, as has been shown in the reports of the British Columbia Commissioner of Fisheries for 1915. The cousin of the present species, the Alaska black cod (*Anoplopoma*), inhabits considerable depths also, and in the last few years more of them are being caught by the halibut-boats. The fishermen even occasionally bring up Macrouroid species, formerly utterly unknown to them. This "rare fish" then has perhaps been caught by the fishermen while they were utilizing unusual depths, and it may well be common and relatively abundant in its peculiar habitat.

The Japanese fishermen, it is worthy of note, fish their waters more closely than is done on our coasts, and Dr. Jordan and Professor Snyder say: "According to Kuma Aoki, an intelligent fisherman of Misaki, it is occasionally taken in the Kuro Siwo, it is not rare, and reaches the weight of 200 lb. Although so rare in collections, the species is well known to the fishermen." There is no good reason why more extensive exploitation of our fishing-ground will not bring to light at least an abundance equal to that of the species in Japan. It is hence unjust to call the fish a "stray," and one must be reserved in calling it "rare." Since the only specimens known to be preserved in museums have come from Japan, and the type of the species (from Monterey, California) which was in the collection of the California Academy of Sciences in San Francisco has been destroyed, the following notes regarding the specimens now at hand are appended:—

The fish, 112 cm. in total length and 98 to base of caudal, is bass-like, with massive head and rotund body; its width ⅔ its depth, but with somewhat slender caudal peduncle, nearly round and quickly tapering. The interorbital is wide, convex, and the preorbitals are prominent, nearly overhanging. The eyes are small, slightly oval lateral in outlook, and over a wide suborbital. The maxillary ends below the centre of the pupil. The lower jaw projects somewhat, its tip lying in the axis of the body, continues the profile lines of the head and body, which taper anteriorly and posteriorly.

The teeth are in a band six or seven series wide anteriorly in the upper jaw, four or five below, narrowing posteriorly; recurved, slender, and sharp; none of them canine-like or enlarged; in a V-shaped patch on vomer; in narrow bands on palatines.

The gill-arches and viscera were removed when the fish was frozen.

The dorsals are apparently separated by the space of two spines, but dissection shows these to be present, buried below the thick skin; two anterior spines are very short; the third is the longest, with the margin of the fin falling straightly to the first buried spine. Preceding the soft rays are two unjoined rays (or spines), closely applied to the third. The soft dorsal is highest at the fifth ray, slightly amarginate in outline. When supine the longest dorsal ray reaches over the bases of the seven following rays, while at the similarly shaped anal reaches to the base of the last. The last rays in both fins are less in length than the eye diameter.

The pectorals are a little falcate in shape, and extend back to the pevel of the eighth dorsal spine. The ventrals are inserted a short distance behind the pectorals.

Scales are present everywhere on exposed surfaces save the lips, edges of fins, membranes of spinous dorsal, edges of branchiostegal flaps, and the inner surfaces of paired fins; rough to touch, they are not roughly ctenoid; they appear non-imbricate because buried deeply.

The colour is very dark, save for projecting whitish edges of scales; only traces of dark bands are present, one as wide as ⅔ of the head-length lying under the pectorals, three others of equal width respectively just before the vent, over the posterior ⅔ of the anal, and on the caudal peduncle. Ventrally the body is not markedly lighter than dorsally. The peritoneum is scraped away, but the buccal lining shows very dark. Lips and the fin edges are black, with strong tinges of blue.

The measurements follow: Head, 0.32 of length to base of caudal; 0.30 depth; body width, 0.19; eye, 0.045; maxillary length, 0.13; width, 0.032; suborbital width, 0.04; snout length, 0.11; mandible, 0.16; interorbital, 0.12; pectoral base, 0.075; length, 0.18; ventral, 0.125; third dorsal spine, 0.085; fifth dorsal ray, 0.11; last, 0.037; fifth anal ray, 0.12; last, 0.037; soft dorsal base, 0.25; anal base, 0.16; depth of caudal peduncle, 0.085; width, 0.07; dorsal rays, XIII., 11, 17; anal, 11, 13; pores in lateral line, 126; scales from lateral line obliquely forward and upward to dorsal insertion, 30; downward and backward to anal, 51; pectoral rays, 19; branchiostegals, 7.—(*Published by permission of J. P. Babcock, Assistant to the Commissioner of Fisheries.*)

ENTOMOLOGY.

The season of 1916 was a very poor one from an entomological point of view, owing to the abnormal weather conditions experienced during the first part of the year. The spring was late in opening up, and the weather was cold and wet until well on in May. In addition, the Lower Mainland and the southern portion of Vancouver Island were visited by exceedingly cold winds which prevailed, more or less, until the end of July. Owing to these conditions there was a dearth of the early insects, and this adverse influence was felt right throughout the summer, causing collections to be far below normal, both in quantity and quality. However, in spite of this, many desirable insects were taken at various points, some of them being new to the Province.

LILLOOET DISTRICT.

Mr. E. M. Anderson, of the Museum staff, collected in the vicinity of Lillooet from the beginning of May until the end of July. Headquarters were established at the Provincial Government Hatchery at Seton Lake, about three miles from Lillooet.

On May 21st a trip was made over the Blackwater Trail about thirty miles from Seton Lake, starting in at the southern end of Anderson Lake and finishing at Blackwater Lake, getting back to headquarters on June 3rd.

An ascent of Mount McLean, which is situated eight miles north of Seton Lake, was made on July 15th, and many good things were taken during the twelve days' sojourn on the mountain, at altitudes varying from 2,000 to 7,000 feet, chief of which was that very rare mountain butterfly, *Oeneis beanii* Elwes. The only previous record of this butterfly for British Columbia is Mount Cheam, near Chilliwack; its type locality is the Rocky Mountains of Colorado.

The total number of insects taken on the trip numbered 1,065, made up as follows: Lepidoptera, 510; Coleoptera, 251; Hymenoptera, 71; Diptera, 157; and 76 of various other orders.

The most noteworthy captures amongst the butterflies, of which 157 were taken, in addition to the one noted above, were: *Pontia napi flava* Edw.; *Phyciodes mylitta pallida* Edw.; *Incisalia polios* Cook & Watson; *Strymon sæpium* Bdv.; and *Pamphila juba* Scud. Amongst the *Sphingidæ*, two specimens of that beautiful little sphinx, *Prosperinus clarkiæ* Bdv. were taken. The noctuids on the whole were disappointing, as sugaring was a complete failure owing to the cold winds prevailing at the time of their greatest abundance. In the early part of May, however, cherry-blossoms were attractive to a few species, and a long series of *Polia crotchii* Grote was taken (a moth new to British Columbia), also a fair series of *Xylomiges perlubens* Grote. Other noctuids taken during the season and worthy of special mention are: *Sidemia longula* Grt.; *Oncocnemis extremis* Em.; *Spargaloma sexpunctata* Grt.; *Syneda alleni* Grt.; and *S. hudsonica* G. & R. The Geometridæ made a better showing: 153 specimens were captured, comprising thirty-eight

PLATE VII.

NOCTUIDÆ NEW TO BRITISH COLUMBIA.

Catocala faustina race *cærulea* Bent.
Okanagan Landing, B.C. (Munro).

Apatela tartarea Sm.
Cowichan Lake, B.C. (Blackmore).

Bomolocha palparia Walk.
Goldstream, B.C. (Blackmore).

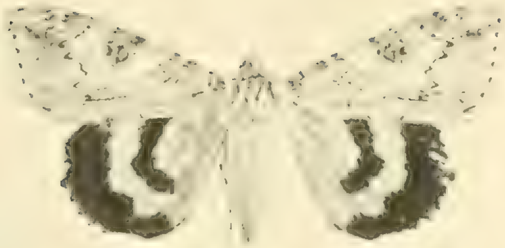
Scotogramma trifolii race *albifusa* Walk.
Victoria, B.C. (Blackmore).

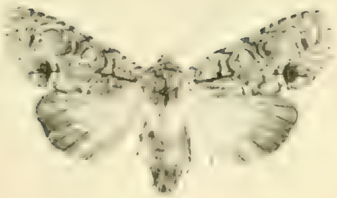
Polia crotchi Grote.
Lillooet, B.C. (Anderson).

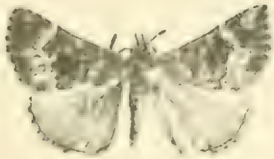
Euxoa andera Sm.
Okanagan Landing, B.C. (Munro).

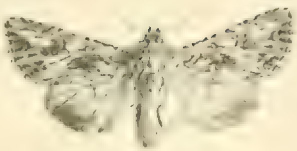
Epidemas melanographa Hamp.
Victoria, B.C. (Blackmore).

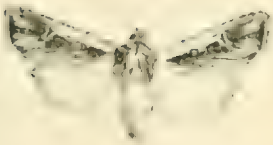
PLATE VII.

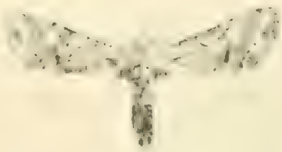












species, the following being new to the Museum collection, viz.: *Hesperumia sulphuraria* form *baltearia* Hulst; *Paraphia subatomaria* Wood; *Sabulodes cervinaria* Pack.; and *S. forficaria* Gn. Other desirable species taken were as follows: *Epirrhœ alternata* Mull.; *Xystrota hepaticaria* Gue.; *Acidalia fuscata* Hulst; *Bapta semiclarata* Walk.; *Dasyfidonia avuncularia* Gue.; *Drepanulatrix falcataria* Pack.; *D. pulveraria* Hulst; and *Spodolepsis substriataria* var. *danbyi* Hulst. Amongst the Microlepidoptera, *Pyrausta funebris* Strom. and *Adela septentrionella* Wals. were the most noteworthy. The Coleoptera, Hymenoptera, and Diptera have not, as yet, been worked over, but there are many in each order new to the Museum collections.

OKANAGAN DISTRICT.

Mr. J. A. Munro collected in the neighbourhood of Okanagan Landing from April 20th until September 28th.

Trips were made to the Nahun Plateau, twenty miles south of Okanagan Landing, where some good insects were taken at an altitude of 3,200 feet. In June five days were spent at Shuswap Falls, about thirty miles east of Vernon; the insect fauna here is somewhat different from that in the vicinity of Okanagan Landing, and a representative collection of some 200 insects were taken during the week. The total number of insects taken during the season was 1,118, comprising: Lepidoptera, 730; Coleoptera, 184; Hymenoptera, 101; Diptera, 45; and 58 of various other orders. Amongst the butterflies worthy of notice were *Parnassius smintheus* var. *magnus* Wright; *Papilio bairdii* var. *oregonia* Edw.; *Argynnis leto* Behr.; *A. meadii* Edw.; *Œneis chryxus* Db.-Hew.; *Nomiades lydgamas* var. *oro* Scud.; *Cupido icarioides* var. *pembina* Edw.; *Erynnis comma* var. *manitoba* Scud.; and *Pholisora catullus* Fab.

(In the above list *N. lydgamas* var. *oro* Scud. is new to British Columbia; it has been probably associated with *N. lydgamas* var. *behrii* in Mainland collections, the males of these two forms bearing a close resemblance to each other. They are in the males differentiated by the much paler blue of the upper side of *oro;* in the females they are more easily separated, *oro* being of a uniform smoky brown with a few blue scales scattered at the base of the wing, while *behrii* is blue with a broad black border. The ground colour of the under side of *oro* is brown, that of *behrii* a light stone colour; the maculation is practically the same in both forms. *Cupido icarioides* var. *pembina* is also a new name to the British Columbia list. This insect has been masquerading under no less than four different names during the last fifteen years—viz., *pheres, fulla, phileros*, and *lycea*.)

The weather conditions were much better during the summer months in the Okanagan District than they were west of the Cascade Range; consequently the noctuid moths taken were greater, both in number and variety, than those taken in the Lillooet District during the same period. In the Catocalæ two species were taken new to British Columbia—a short series of *Catocala faustina* var. *cærulea* Edw. and a single specimen of *C. californica* Hy. Edw. A beautiful specimen of the rare *C. relicta* Walk. was also taken at sugar on August 25th.

Other specimens worthy of record are the following: *Caradrina extimia* Walk.; *Rhynchagrotis rufipectus* Morr.; *R. variata* Grt.; *Abagrotis erratica* Sm.; *Porosagrotis catenula* Grt.; *Mamestra discalis* Gue.; *Heliothis scutosus* Fabr.; *Heliaca nexilis* Morr.; and *Syneda annexa* Hy. Edw.

The Geometridæ were far below the average both in quantity and quality, although two species new to the Museum collection were taken—*Eudule mendica* Walk. and *Sabulodes lorata* Grt. Other desirable species taken were *Cosymbia lumenaria* Hub.; *Acidalia subfuscata* Taylor; and *Metanema inatomaria* Guen.

The Coleoptera, Hymenoptera, and Diptera still await classification and determination. Many of them, however, are new to the Museum collections, especially in the order Coleoptera.

VICTORIA DISTRICT.

The following list of noctuids taken in the vicinity of Victoria during the past season by Mr. E. H. Blackmore, of this city, are of more than passing interest, as the first three are new to British Columbia, while the others are of rare occurrence: *Rhynchagrotis morrisonistigma* Grt.; *Scotogramma trifolii* var. *albifusa* Walk.; *Bomolocha palparia* Walk.; *Cerma cuerva* Barnes; *Hadena plutonia* Grt.; *Epidemas melanographa* Hamp.; *Polia radix* Walk.; *Pyrophila tragopoginis* Linn.; *Adelphagrotis apposita* Grt.; *Euxoa costata* Grt.; *Polia restora* Sm.; *Zosteropoda hirtipes* Grt.; *Stretchia muricina* Grt.; *Xylina dilatocula* Sm.; *Helotropha reniformis* Grt.; and *Ipimorpha nanaimo* Barnes.

Amongst the Geometridæ the same collector took a specimen of *Hydriomena furcata* var. *periclata* Swett. This is the first record for British Columbia of this insect, its type locality being San Francisco, Cal.; also two specimens of *Ania limbata* Haw., and one specimen of *Metanema inatomaria* Gue. These are the first captures of these two geometers that have been recorded for over twelve years from this district.

GEOMETRIDÆ NEW TO SCIENCE.

Through the activities of Mr. E. H. Blackmore, who is still pursuing his studies of the British Columbia Geometridæ, two species and four varieties new to science have been discovered. They have been described by Mr. L. W. Swett, the well-known geometrid specialist of West Somerville, Mass., the descriptions appearing in the *Canadian Entomologist*, Vol. XLVIII., page 249 *et seq.* (July, 1916), and Vol. XLIX., page 64 *et seq.* (February, 1917), and are here illustrated for the first time. (*See* Plate VIII.)

They are as follows: *Nomenia obsoleta* Swett, described from three specimens taken at Goldstream and Victoria, B.C., found in the collection of the late Captain R. V. Harvey, and one specimen found in the Provincial Museum collection taken at Victoria, and all dated April, 1908. The latter was made a male paratype and is now in the exhibition collection of the Museum; *Hydriomena californata* ab. *niveifascia* Swett, described from two specimens—one taken at Goldstream and the other at Victoria—found in the collection of the late Captain Harvey; *Diastictis andersoni* Swett, described from three specimens taken by E. M. Anderson on his trip to Atlin, B.C., in 1914. A male paratype of this new species is also in the Museum exhibition case; *Dysstroma mulleolata* ab. *sobria* Swett, described from a single male taken by E. H. Blackmore at Victoria in June, 1914; *D. mulleolata* ab. *subumbrata*, Swett, described from five specimens taken by Mr. Blackmore at Victoria in June and July, 1914-15; and *D. mulleolata* ab. *ochrofuscaria* Swett, described from specimens taken by Mr. E. H. Blackmore at Victoria, B.C., and by Mr. G. O. Day and Mr. A. W. Hanham, at Duncan, B.C.

Mr. Blackmore has kindly donated to the Museum collection a female paratype of *D. mulleolata* var. *subumbrata* Swett, and a typical specimen of *D. mulleolata* var. *ochrofuscaria* Swett.

CORRIGENDA AND ADDENDA.

Owing to a further examination of the types of North American butterflies by that eminent lepidopterist, Dr. J. McDunnough, of Decatur, Ill., two of the species figured in the Provincial Museum Report for 1915 have been found to be named incorrectly.

Parnassius smintheus var. *nanus* Neu. (page 16 and Figs. 2 and 3, Plate VIII.) should be corrected to *Parnassius smintheus* Db.-Hew. (*vide*,Cont. Lep. No. Amer., Barnes & McDunnough, Vol. III., No. 2, Dec., 1916). The specimens taken at Atlin in 1914 are identical with the type specimens in the British Museum taken by Lord Derby in the Canadian Rockies. The aberration *nanus* Neu. occurs in the male only, and is distinguished by having the two red occelli on the secondaries replaced by one black spot.

Brenthis frigga var. *improba* Butler (page 16 and Figs. 8 and 9, Plate VIII.) turns out to be *Brenthis youngi* Holland, described from Alaska in 1900. This is another new record for British Columbia and was taken at Atlin in 1914.

On page 17 *Œneis norna* var. *taygete* Hub. should be changed to *Œ. taygete* Hub., as the latter is a species quite distinct from *norna* Thun.

Owing to an oversight on the part of those making the "cut" of *Rhachogaster kermodei* Townsend (Plate X., Fig. 1) the name of the artist was omitted. The drawing was made by Mr. C. W. Young, who is attached to the Experimental Farm at Agassiz, and is an excellent piece of work.

PLATE VIII.

GEOMETRIDÆ

Dysstroma mulleolata Hulst.
Victoria, B.C. (Blackmore).
(New to British Columbia.)

Dysstroma mulleolata form *subumbrata* Swett.
Victoria, B.C. (Blackmore).
(New to science.)

Dysstroma mulleolata form *ochrofuscaria* Swett.
Victoria, B.C. (Blackmore).
(New to science.)

Alcis sulphuraria form *baltearia* Hulst.
Lillooet, B.C. (Anderson).
(New to British Columbia.)

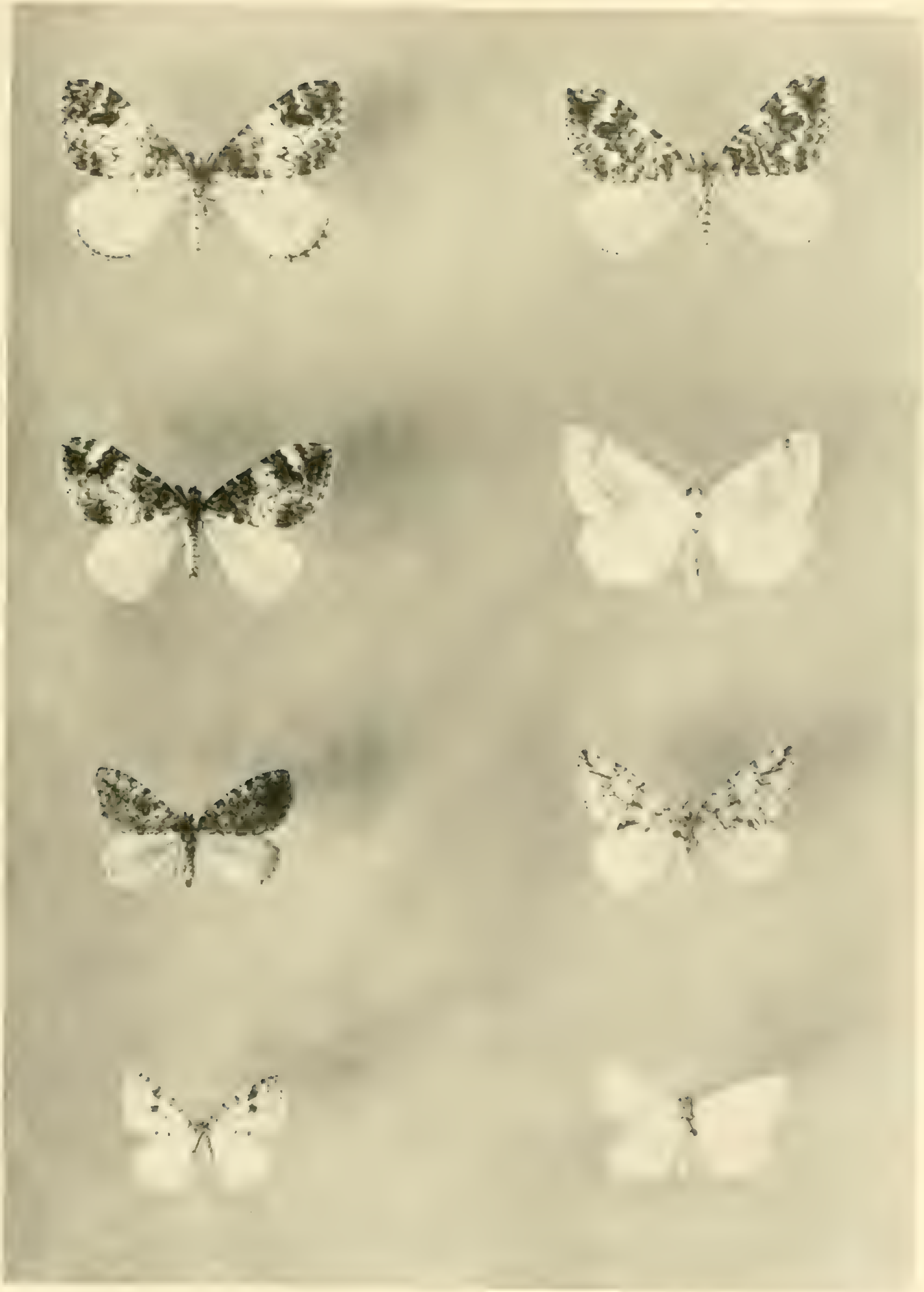
Hydriomena furcata race *periclata* Swett.
Victoria, B.C. (Blackmore).
(New to British Columbia.)

Hydriomena californiata form *nircifascia* Swett.
Victoria, B.C. (Harvey coll.).
(New to science.)

Nomenia obsoleta Swett.
Goldstream, B.C. (Harvey coll.).
(New to science.)

Diastictis andersoni Swett.
Atlin, B.C. (Anderson).
(New to science.)

PLATE VIII.



BOTANICAL SPECIMENS COLLECTED IN THE LILLOOET DISTRICT, 1916.

By F. Kermode and E. M. Anderson.

(Identified by J. M. Macoun, Curator of Herbarium, Ottawa.)

Polypodiaceæ.

Aspidium spinulosum (O. F. Müller) Sw. Mount McLean.
Cystopteris fragilis (L.) Bernh. Mount McLean.
Polystichum lonchitis (L.) Roth. Mount McLean.
Woodsia scopulina D. C. Eaton. Lillooet.

Lycopodiaceæ.

Lycopodium complanatum L. Lillooet.

Pinaceæ.

Juniperus communis L. Mount McLean.
Pinus contorta Douglas. Mount McLean.

Selaginellaceæ.

Selaginella ? Wallacei. Lillooet.

Gramineæ.

Agropyron tenerum Vasey. Lillooet.
Bromus sterilis L. Lillooet.
Poa pratensis L. Lillooet.
Phleum alpinum L. Mount McLean.
Koeleria cristata Pers. var. major. Lillooet.
Calamagrostis purpurasceus R. Rd. Mount McLean.
Setaria viridis (L.) Beauv. Lillooet.

Juncaceæ.

Luzula spicata (L.) D.C. Mount McLean.

Liliaceæ.

Allium stellatum Ker. Lillooet.
Calochortus macrocarpus Dougl. Lillooet.
Clintonia uniflora (Schult.) Kunth. Mount McLean.
Disporum oreganum (S. Wats.) Benth. Seton Lake. (F. K.)
Disporum trachycarpum S. Wats. Lillooet.
Lilium parviflorum (Hook.) Holz. Seton Lake. (F.K.)
Smilacina racemosa (L.) Desf. Seton Lake. (F. K.)
Veratrum viride Ait. Mount McLean.
Zygadenus venenosus S. Wats. Mount McLean.

Orchidaceæ.

Calypso bulbosa (L.) Oakes. Lillooet.
Crypripedium montanum Dougl. Mount McLean.
Corallorrhiza multiflora Nutt. (*maculata* Raf.)
Habenaria leucostachys. Mount McLean.

Salicaceæ.

Populus tremuloides Michx. Lillooet.
Populus trichocarpa T. & G. Lillooet.
Salix sp. Mount McLean.
Salix Bebbiana Sargent. Lillooet.
Salix Scouleriana. Lillooet.

BETULACEÆ.

Betula alba var. *papyrifera* (Marsh) Spach. Lillooet.

SANTALACEÆ.

Comandra pallida A. D.C. Seton Lake. (F. K.)

POLYGONACEÆ.

Eriogonum subalpinum Greene. Mount McLean.
Oxyria digyna (L.) Hill. Mount McLean.
Polygonum Convolvulus L. Lillooet.
Rumex Acetosella L. Lillooet.

CHENOPODIACEÆ.

Chenopodium sp. Lillooet.
Chenopodium album. Lillooet.

AMARANTHACEÆ.

Amaranthus retroflexus L. Lillooet.

CARYOPHYLLACEÆ.

Arenaria capillaris var. *nardifolia* (Ledeb.) Regel. Mount McLean.
Arenaria sajanensis Willd. Mount McLean.
Cerastium arvense L. var. A. Lillooet.
Cerastium arvense L. var. B. Lillooet.
Cerastium Behringianum C. & S. Mount McLean.
Silene acaulis L. Mount McLean.
Silene Menziesii Hook. Mount McLean.

PORTULACACEÆ.

Claytonia perfoliata Donn. Seton Lake. (F. K.)
Claytonia lanceolata Pursh. Mount McLean.

RANUNCULACEÆ.

Anemone multifida Poir. Seton Lake. (F.K.)
Anemone occidentalis S. Wats. Mount McLean.
Anemone parviflora D.C. Mount McLean.
Aquilegia formosa Fisch. Seton Lake. (F. K.)
Clematis ligusticifolia Nutt. Lillooet.
Delphinium bicolor Nutt. Seton Lake. (F. K.)
Ranunculus glaberrimus Hook. Lillooet.
Ranunculus Eschscholtzii Schlecht. Mount McLean.
Trollius laxus Salisb. Mount McLean.

BERBERIDACEÆ.

Berberis aquifolium Pursh. Lillooet.

FUMARIACEÆ.

Corydalis aurea Willd. Seton Lake. (F. K.)

CRUCIFERÆ.

Arabis sp. (? addition to flora of British Columbia). Lillooet.
Arabis canescens T. & G. Lillooet.
Arabis Drummondii Gray. Mount McLean.
Arabis hirsuta (L.) Scop. Mount McLean.

Capsella Bursa-pastoris (L.) Medic. Lillooet.
Draba alpina L. and var. *glacialis* Dickie. Mount McLean.
Draba aurea Vahl. Mount McLean.
Draba nemorosa L. Lillooet.
Draba nivalis Lilj. (fruit wanting; identification not positive). Mount McLean.
Erysimum parviflorum Nutt. Lillooet.
Lepidium apetalum Willd. Lillooet.
Radicula nasturtium aquaticum (L.) Britton. Seton Lake.
Sisymbrium incisum Engelm. Lillooet.

CRASSULACEÆ.

Sedum divergens S. Wats. Mount McLean.
Sedum stenopetalum Pursh. Seton Lake. (F. K.)

SAXIFRAGACEÆ.

Heuchera cylindrica Dougl. Lillooet.
Mitella trifida Graham. Mount McLean.
Philadelphus Lewisii Pursh. Lillooet.
Ribes irriguum Dougl. Lillooet.
Saxifraga bronchialis L. Mount McLean.
Saxifraga cæspitosa L. Mount McLean.
Saxifraga occidentalis S. Wats. Mount McLean.
Saxifraga nivalis L. Lillooet.
Saxifraga oppositifolia L. Mount McLean.
Tellima parviflora Hook. Lillooet.
Tiarella unifoliata Hook. Mount McLean.

ROSACEÆ.

Amelanchier florida Lindl. Lillooet.
Amelanchier Cusickii Fern. Lillooet.
Cratægus brevispina (Dougl.) Heller. Lillooet.
Dryas octopetala L. Mount McLean.
Fragaria cuneifolia Nutt. Mount McLean.
Fragaria glauca (S. Wats.) Ryal. Lillooet.
Geum triflorum Pursh. Seton Lake. (F. K.)
Potentilla fruticosa L. Mount McLean.
Potentilla oregana Nutt. Lillooet.
Potentilla glandulosa (Lindl.) Rydb. Lillooet.
Potentilla glaucophylla Lehm. Mount McLean.
Potentilla monspeliensis L. Lillooet.
Potentilla nivea L. Mount McLean.
Potentilla rivalis Nutt. Mount McLean.
Prunus demissa (Nutt.) Dietr. Lillooet.
Rosa pisocarpa Gray. Lillooet.
Rosa sp. Lillooet.
Rubus parviflorus Nutt. Lillooet.
Rubus leucodermis Dougl. Lillooet.
Spiræa discolor Pursh. Lillooet.
Spiræa lucida Dougl. Seton Lake.

LEGUMINOSÆ.

Astragalus tenellus Pursh. Lillooet. (F. K.)
Hosackia denticulata S. Wats. Lillooet.
Lupinus arcticus S. Wats. Lillooet.
Lupinus Lyallii Gray. Mount McLean.
Vicia angustifolia Reich. Lillooet.
Vicia sativa L. Lillooet.

ANACARDIACEÆ.

Rhus Rydbergii Small. Seton Lake. (F. K.)
Rhus glabra occidentalis Torr. Lillooet.

ACERACEÆ.

Acer Douglasii Hook. Lillooet.

RHAMNACEÆ.

Ceanothus sanguineus Pursh. Lillooet.
Ceanothus velutinus Dougl. Lillooet.

VIOLACEÆ.

Viola adunca Smith. Mount McLean.
Viola canadensis L. Mount McLean.
Viola orbiculata Geyer. Mount McLean.
Viola mistassinica Greene. Lillooet.

LOASACEÆ.

Mentzelia albicaulis Dougl. Lillooet.

ELAEAGNACEÆ.

Elæagnus argentea Pursh. Seton Lake. (F. K.)

ONAGRACEÆ.

Epilobium alpinum L. Mount McLean.
Epilobium angustifolium L. Lillooet.
Epilobium paniculatum Nutt. Lillooet.

ARALIACEÆ.

Aralia nudicaulis L. Seton Lake. (F. K.)

UMBELLIFERÆ.

Heracleum lanatum Michx. Mount McLean.
Lomatium macrocarpum (Nutt.) C. & R. Lillooet.
Lomatium triternatum (Nutt.) C. & R. Lillooet.

CORNACEÆ.

Cornus pubescens Nutt. Lillooet.

ERICACEÆ.

Cassiope Mertensiana Don. Mount McLean.
Kalmia glacua Ait. Lillooet.
Moneses uniflora (L.) Gray. Mount McLean.
Phyllodoce empetriformis (Sm.) D. Don. Mount McLean.
Pyrola secunda L. Mount McLean.
Pyrola chlorantha Hook. Mount McLean.
Rhododendron albiflorum Hook. Mount McLean.
Vaccinium scoparium Leiberg. Mount McLean.

PRIMULACEÆ.

Androsace occidentalis Pursh. Mount McLean.
Dodecatheon vulgare (Hook.) Piper. Lillooet.

GENTIANACEÆ.

Gentiana acuta Michx. Mount McLean.

APOCYNACEÆ.

Apocynum androsæmifolium L. Seton Lake. (F. K.)

POLEMONIACEÆ.

Polemonium humile R. & S. Mount McLean.
Phlox diffusa Benth. Lillooet.
Gilia gracilis Hook. Lillooet.

HYDROPHYLLACEÆ.

Phacelia leucophyhlla Torr. Lillooet.
Phacelia Menziesii (R. Br.) Torr. Lillooet.
Phacelia sericea (Graham) A. Gray. Mount McLean.

BORAGINACEÆ.

Amsinckia lycopsoides Lehm. Lillooet.
Lappula hispida (A. Gray) Greene. Lillooet. (F. K.)
Lappula Redowskii (Hornem.) Greene. var. *occidentalis* (Wats.) Rydb. Lillooet.
Lithospermum angustifolium Michx. Seton Lake. (F. K.)
Lithospermum pilosum Nutt. Seton Lake.
Myosotis alpestris Schmidt. Mount McLean.

LABIATÆ.

Nepeta cataria L. Lillooet.

SCROPHULARIACEÆ.

Castilleja angustifolia Nutt., var *Bradburii* Fernald. Lillooet.
Castilleja miniata Dougl. Seton Lake. (F. K.)
Castilleja Suksdorfii Gray. Mount McLean.
Collinsia grandiflora var. *pusilla* Gray. Lillooet.
Pentstemon diffusus Dougl. Mount McLean.
Pentstemon procerus Dougl. Mount McLean.
Pentstemon Scouleri Dougl. Mount McLean.
Pedicularis bracteosa Benth. Mount McLean.
Pedicularis Langsdorffii. Mount McLean.
Veronica alpina L. Mount McLean.

RUBIACEÆ.

Galium aparine L. Lillooet.

PLANTAGINACEÆ.

Plantago Purshii R. & S. Lillooet.

CAPRIFOLIACEÆ.

Lonicera ciliosa Poir. Seton Lake. (F. K.)
Symphoricarpos racemosus Michx. Lillooet.

VALERIANACEÆ.

Valeriana sitchensis Bong. Mount McLean.

COMPOSITÆ.

Achillea Millefolium L. Seton Lake. (F.K.)
Agoseris glauca (Pursh.) Steud. Mount McLean.
Agoseris aurantiaca (Hook.) Greene. Mount McLean.
Antennaria Howellii Greene. Lillooet.
Antennaria rosea Greene. Mount McLean.
Antennaria pulvinata Greene. Mount McLean.

Antennaria racemosa Greene. Lillooet.
Aplopappus Lyalli Gray. Mount McLean.
Arnica cordifolia Hook. Lillooet.
Arnica latifolia Bong. Mount McLean.
Artemisia frigida Willd. Seton Lake. (F. K.)
Artemisia discolor Dougl. Lillooet.
Artemisia racemosa. Mount McLean.
Balsamorhiza sagittata Nutt. Seton Lake. (F.K.)
Carduus undulatus Nutt. Lillooet.
Chrysopsis villosa Nutt. Lillooet.
Crepis intermedia Gray. Seton Lake. (F. K.)
Erigeron callianthemus Greene. Mount McLean.
Erigeron compositus Pursh. Mount McLean.
Erigeron filifolius. Lillooet.
Erigeron speciosus DC. Lillooet.
Gaillardia aristata Pursh. Lillooet.
Hieracium albiflorum Hook. Lillooet.
Solidago corymbosa Nutt. Mount McLean.
Senecio exaltatus Nutt. Mount McLean.
Senecio Fremontii T. & G. Mount McLean.

PLANTS COLLECTED IN HENDERSON LAKE DISTRICT, 1916.

By W. A. Newcombe.

POLYPODIACEÆ.

Phegopteris polypodioides Fee.

PINACEÆ.

Juniperus scopulorum Sarg.

LILIACEÆ.

Tofieldia intermedia Rydb.
Erythronium revolutum Smith.
Fritillaria lanceolata Pursh.
Disporum oreganum (Wats.) B. & H.

ORCHIDACEÆ.

Habenaria stricta Lindl.

RANUNCULACEÆ.

Ranunculus Bongardi Greene.
Trautvetteria grandis Nutt
Anemone Lyallii Britt.
Coptis asplenifolia Salisb.
Aquilegia formosa Fischer.

CRUCIFERÆ.

Arabis sp.

SAXIFRAGACEÆ.

Boykinia occidentalis T. & G.
Tiarella trifoliata L.
Tellima grandiflora Dougl.
Tolmiea Menziesii (Pursh) T. & G.

ROSACEÆ.

Pyrus sitchensis (Roem.) Piper.
Sanguisorba latifolia (Hook.) Coville.
Geum macrophyllum Willd.
Rosa sp.

HYPERICACEÆ.

Hypericum Scouleri Hook.

VIOLACEÆ.

Viola sp.

ONAGRACEÆ.

Epilobium sp.

UMBELLIFERÆ.

Lomatium Martindalei var. *angustatum* C. & R.

CORNACEÆ.

Cornus canadensis L.

ERICACEÆ.

Menziesia ferruginea Smith.

GENTIANACEÆ.

Gentiana sceptrum Griseb. Uchucklesit Harbour.
Menyanthes crista-galli Menz.

POLEMONIACEÆ.

Phlox diffusa Dougl.

HYDROPHYLLACEÆ.

Romanzoffia sitchensis Bong.

SCROPHULARIACEÆ.

Pentstemon Menziesii Hook.
Pentstemon diffusus Dougl.
Castilleja miniata Dougl.
Mimulus Lewisii Pursh.

RUBIACEÆ.

Galium cymosum Wiegand.

VALERIANACEÆ.

Valeriana sitchensis Bong., var. *Scouleri* (Rydb.) Piper.

COMPOSITÆ.

Erigeron sp.
Erigeron sp.
Eriophyllum lanatum (Pursh) Forbes.
Achillea Millefolium L.
Petasites speciosa (Nutt.) Piper.
Arnica sp.
Luina hypoleuca Benth.
Nabalus alatus Hook.

PLANTS COLLECTED IN CRANBROOK DISTRICT.

By C. B. Garrett.

(Identified by J. M. Macoun, C.M.G., Curator of Herbarium, Geological Survey, Ottawa.)

POLYPODIACEÆ.

Phegopteris Dryopteris (L.) Fée. St. Mary's Lake.
Pteris aquilina L., var. *lanuginosa* Bong. St. Mary's Lake.
Cryptogramma acrostichoides R. Br. St. Mary's Lake.
Asplenium cyclosorum Rupr. St. Mary's Lake.
Woodsia scopulina D. C. Eaton. Whitefoot Creek.

CYPERACEÆ.

Carex Richardsonii R. Br. Cranbrook.
Carex tenella Schk. Cranbrook.

JUNCACEÆ.

Luzula glabrata Desv. Whitefoot Creek.

LILIACEÆ.

Zygadenus chloranthus Rich. Cranbrook.
Zygadenus venenosus Wats. Cranbrook.
Allium cernuum Roth. Cranbrook.
Lilium parviflorum (Hook.) Holtz. St. Mary's Lake and Whitefoot Creek.
Fritillaria pudica (Pursh) Spreng. Cranbrook.
Erythronium grandiflorum Pursh, var. *parviflorum* Wats. St. Mary's Lake.
Calochortus elegans Pursh. St. Mary's Lake.
Calochortus macrocarpus Dougl. Cranbrook.
Clintonia uniflora Kunth. St. Mary's Lake.
Smilacina stellata (L.) Desf. Cranbrook.
Disporum trachycarpum B. & H. St. Mary's Lake.
Smilacina amplexicaulis Nutt. St. Mary's Lake.

IRIDACEÆ.

Sisyrinchium angustifolium Miller. Cranbrook.

ORCHIDACEÆ.

Habenaria elegans Boland. St. Mary's Lake.
Habenaria dilatata Hook. St. Mary's Lake.
Spiranthes Romanzoffiana Cham. Cranbrook.
Calypso bulbosa (L.) Oakes. Whitefoot Creek.

BETULACEÆ.

Alnus tenuifolia Nutt. St. Mary's Lake.

SANTALACEÆ.

Comandra pallida A. DC. Cranbrook.

POLYGONACEÆ.

Eriogonum umbellatum Torr. St. Mary's Lake.
Polygonum amphibium L. Cranbrook.

CARYOPHYLLACEÆ.

Arenaria lateriflora L. Cranbrook.
Arenaria serpyllifolia L. Cranbrook.
Stellaria graminea L. St. Mary's Lake.
Stellaria longifolia Muhl. Cranbrook.
Cerastium arvense L. Cranbrook.
Cerastium viscosum L. St. Mary's Lake.
Silene Menziesii Hook. Cranbrook.

PORTULACEÆ.

Claytonia lanceolata Pursh. Whitefoot Creek.
Lewisia rediviva Pursh. Cranbrook.

RANUNCULACEÆ.

Ranunculus Flammula L., var. *reptans* (L.) Meyer. Cranbrook.
Ranunculus glaberrimus Hook. Cranbrook.
Ranunculus Macounii Britt. Glabrate. St. Mary's Lake.
Ranunculus Eschscholtzii Schlecht. St. Mary's Lake.
Anemone patens L., var. *Wolfgangiana* (Bess.) Koch. Cranbrook.
Anemone multifida Poir. Cranbrook.
Anemone occidentalis Freyn. St. Mary's Lake.
Clematis columbiana Hornem. Cranbrook.
Trollius laxus Salisb. St. Mary's Lake.

Aquilegia formosa Fisch., var. *flavescens* (Wats.) Frye & Rigg. St. Mary's Lake.
Delphinium columbianum Greene. Cranbrook.
Actaea arguta Nutt. St. Mary's Lake.

BERBERIDACEÆ.

Berberis aquifolium Pursh. Cranbrook.

FUMARIACEÆ.

Corydalis aurea Willd. St. Mary's Lake.

CRUCIFERÆ.

Alyssum calycinum L. Cranbrook.
Lesquerella Douglasii Wats. St. Mary's Lake.
Thlaspi arvense L. (introduced). Cranbrook.
Capsella Bursa-pastoris (L.) Medic. Cranbrook.
Sisymbrium incisum Engelm. Cranbrook.
Sisymbrium incisum Engelm., var. *Hartwegianum* (Fourn) Wats. Cranbrook.
Erysimum asperum DC. Cranbrook.
Erysimum parviflorum Nutt. Cranbrook.
Cardamine pennsylvanica Muhl. St. Mary's Lake.
Arabis hirsuta (L.) Scop. Whitefoot Creek.

CRASSULACEÆ.

Sedum stenopetalum Prush. St. Mary's Lake.

SAXIFRAGACEÆ.

Saxifraga occidentalis Wats. Cranbrook.
Saxifraga bronchialis L. St. Mary's Lake.
Mitella pentandra Hook. St. Mary's Lake.
Mitella trifida Graham. St. Mary's Lake.
Heuchera glabella T. & G. Cranbrook.
Tellima tenella (Nutt.) Walp. Cranbrook.
Ribes viscosissimum Pursh. Whitefoot Creek.

ROSACEÆ.

Spiræa lucida Dougl. St. Mary's Lake.
Pyrus sitchensis (Roem.) Piper. St. Mary's Lake.
Fragaria platypetala Rydb. Cranbrook.
Potentilla monspeliensis L. St. Mary's Lake.
Potentilla fruticosa L. Cranbrook.
Potentilla anserina L. Cranbrook.
Geum strictum Ait. Cranbrook.
Rubus pedatus Smith. St. Mary's Lake.
Rubus pubescens Raf. Cranbrook.
Rosa sp. Cranbrook.
Prunus demissa Walp. St. Mary's Lake.
Purshia tridentata DC. Mission.

LEGUMINOSÆ.

Lupinus argenteus Pursh. Cranbrook.
Trifolium repens L. St. Mary's Lake.
Trifolium hybridum L. (introduced). St. Mary's Lake.
Astragalus campestris Gray. Cranbrook.
Astragalus spicatus Nutt. Cranbrook.
Oxytropis monticola Gray. Cranbrook.
Vicia americana Muhl. Cranbrook.
Lathyrus ochroleucus Hook. Cranbrook.

GERANIACEÆ.

Geranium viscosissimum F. & M. St. Mary's Lake.

ACERACEÆ.

Acer Douglasii Hook. St. Mary's Lake.

RHAMNACEÆ.

Ceanothus velutinus Dougl. St. Mary's Lake.

HYPERICACEÆ.

Hypericum Scouleri Hook. St. Mary's Lake.

VIOLACEÆ.

Viola sp.? Cranbrook.
Viola adunca Smith, var. Cranbrook.
Viola nephrophylla Greene. Cranbrook.
Viola orbiculata Geyer. Whitefoot Creek.
Viola glabella Nutt. St. Mary's Lake.
Viola canadensis L. St. Mary's Lake.

ONAGRACEÆ.

Œnothera muricata L. Cranbrook.

ARALIACEÆ.

Aralia nudicaulis L. Cranbrook.

UMBELLIFERÆ.

Lomatium triternatum (Nutt.) Cranbrook.
Leptotaenia multifida Nutt. Whitefoot Creek.

CORNACEÆ.

Cornus stolonifera Michx. Cranbrook.
Cornus canadensis L. St. Mary's Lake.

ERICACEÆ.

Moneses uniflora (L.) Gray. Cranbrook.
Pyrola secunda L. St. Mary's Lake.
Pyrola bracteata Hook. St. Mary's Lake.
Phyllodoce empetriformis (Sm.) D. Don. Whitefoot Creek.
Arctostaphylos Uva-ursi (L.) Spreng. Cranbrook.

PRIMULACEÆ.

Dodecatheon pauciflorum Greene (?). Cranbrook.

GENTIANACEÆ.

Gentiana Amarella L., var. *acuta* (Michx.) Herder. Cranbrook.
Gentiana affinis Griesb. Cranbrook.
Menyanthes trifoliata L. Cranbrook.

POLEMONIACEÆ.

Phlox diffusa Benth. Cranbrook.
Gilia linearis (Nutt.) Gray. St. Mary's Lake.

HYDROPHYLLACEÆ.

Phacelia Menziesii Torr. (R. Br.). Cranbrook.
Phacelia leucophylla Torr. St. Mary's Lake.

BORAGINACEÆ.

Lappula occidentalis (Wats.) Rydb. Cranbrook.
Lappula diffusa (Lehm.) Greene. Whitefoot Creek.
Mertensia oblongifolia Don. Mission.
Lithospermum ruderale Dougl. Cranbrook.

LABIATÆ.

Scutellaria galericulata L. Cranbrook.
Prunella vulgaris L. St. Mary's Lake.
Stachys scopulorum Greene. Cranbrook.
Monarda mollis L. Cranbrook.
Mentha canadensis L. Cranbrook.

SCROPHULARIACEÆ.

Collinsia parviflora Lindl. Cranbrook.
Pentstemon sp. Cranbrook.
Pentstemon confertus Dougl. Cranbrook.
Pentstemon scopulorum Piper. St. Mary's Lake.
Pentstemon Scouleri Dougl. Cranbrook.
Mimulus nasutus Greene. St. Mary's Lake.
Veronica americana Schwein. Cranbrook.
Veronica alpina L. St. Mary's Lake.
Veronica humifusa Dickson. St. Mary's Lake.
Castilleja angustifolia Don., var. *Bradburii* Fernald. St. Mary's Lake.
Orthocarpus tenuifolius Benth. St. Mary's Lake.
Pedicularis racemosa Hook. St. Mary's Lake.

LENTIBUARIACEÆ.

Utricularia vulgaris L. Cranbrook.

RUBIACEÆ.

Galium boreale L. Cranbrook.
Galium trifidum L., var. St. Mary's Lake.

CAPRIFOLIACEÆ.

Lonicera involucrata (Richards.) Banks. Cranbrook.
Linnæa borealis L., var. *americana* (Forbes) Rehder. St. Mary's Lake.
Sambucus melanocarpa Gray. St. Mary's Lake.
Sambucus racemosa L. St. Mary's Lake.

CAMPANULACEÆ.

Campanula rotundifolia L. Cranbrook.

COMPOSITÆ.

Chrysopsis villosa (Pursh) Nutt. St. Mary's Lake.
Chrysopsis hirsuta Nutt. Cranbrook.
Solidago decumbens Greene. St. Mary's Lake.
Erigeron acris L. St. Mary's Lake.
Erigeron acris L. (a form of). Cranbrook.
Erigeron corymbosus Nutt. St. Mary's Lake.
Erigeron hispidissimus (Hook.) Piper. Cranbrook.
Erigeron salsuginosus (Rich.) A. Gray. St. Mary's Lake.
Erigeron speciosus DC. St. Mary's Lake.
Aster multiflorus Ait. Cranbrook.
Aster stenomeres Gray. St. Mary's Lake.
Antennaria racemosa Hook. St. Mary's Lake.

Antennaria rosea Greene. Cranbrook.
Antennaria anaphaloides Rydb. St. Mary's Lake.
Antennaria Howellii Greene (small leaves form). Cranbrook.
Anaphalis margaritaceæ (L.) B. & H. Cranbrook.
Balsamorhiza sagittata Nutt. Cranbrook.
Gaillardia aristata Pursh. St. Mary's Lake.
Achillea lanulosa Nutt. Cranbrook.
Chrysanthemum leucanthemum L. Cranbrook.
Arnica gracilis Rydb. St. Mary's Lake.
Arnica cordifolia Hook. St. Mary's Lake.
Arnica fulgens Pursh. Cranbrook.
Arnica grandifolia Greene. Cranbrook.
Senecio triangularis Hook. St. Mary's Lake.
Senecio pseudaureus Rydb. St. Mary's Lake.
Senecio canus Hook. (unusual form with dentate leaves). Cranbrook.
Hieracium albiflorum Hook. Whitefoot Creek.
Hieracium sp. Cranbrook.
Crepis intermedia Gray. St. Mary's Lake.
Crepis gracilis (D. C. Eaton) Rydb. Cranbrook.

PLANTS COLLECTED IN OKANAGAN DISTRICT, 1915.

By J. A. Munro.

Polypodiaceæ.

Asplenium Filix-femina (L.) Bernh.
Polypodium vulgare L.

Liliaceæ.

Zygadenus venenosus S. Watts.
Allium cernuum Roth.
Lilium parviflorum (Hook.) Holz.
Fritillaria lanceolata Pursh.
Fritillaria pudica (Pursh) Spreng.
Calochortus macrocarpus Dougl.
Clintonia uniflora Kunth.
Smilacina stellata (L.) Desf.
Smilacina sessilifolia Nutt.

Orchidaceæ.

Cypripedium montanum Dougl.
Cypripedium parviflorum Salisb.
Habenaria dilatata (Pursh) Gray.
Habenaria unalaschensis (Spreng.) Wats.
Habenaria obtusata (Pursh) Richards.
Habenaria elegans Lindl.
Epipactis decipiens (Hook.) Ames.
Listera convallarioides Torr.
Corallorrhiza multiflora Nutt.
Calypso bulbosa (L.) Oakes.

Santalaceæ.

Comandra pallida A. DC.

Polygonaceæ.

Polygonum acre H. B. K., var. *leptostachyum* Meisn.
Polygonum lapathifolium L.
Eriogonum angustifolium Nutt.

Caryophyllaceæ.

Agrostemma Githago L. (introduced).

RANUNCULACEÆ.

Clematis columbiana (Nutt.) T. & G.
Ranunculus glaberrimus Hook.
Delphinium sp.
Actaea arguta Nutt.

SAXIFRAGACEÆ.

Tellima parviflora Hook.

ROSACEÆ.

Spiræa lucida Dougl.
Spiræa discolor Maxim.
Potentilla anserina L.
Potentilla monspeliensis L.
Geum triflorum Pursh.

LEGUMINOSÆ.

Astralagus campestris Gray.
Vicia americana Muhl.
Lathyrus ochroleucus Hook.

GERANIACEÆ.

Erodium cicutarium (L.) L'Herit.

MALVACEÆ.

Sphæralcea acerifolia Nutt.

HYPERICACEÆ.

Hypericum Scouleri Hook.

VIOLACEÆ.

Viola adunca Smith.
Viola canadensis L.

ONAGRACEÆ.

Epilobium angustifolium L.
Epilobium adenocaulon Haussk.

ERICACEÆ.

Arctostaphylos Uva-ursi L.

PRIMULACEÆ.

Dodecatheon Meadia L., var. *pauciflorum* Durand.
Steironema ciliatum (L.) Raf.

HYDROPHYLLACEÆ.

Phacelia Menziesii (R. Br.) Torr.

SCROPHULARIACEÆ

Pentstemon Scouleri Lindl.

OROBANCHACEÆ.

Orobanche fasciculata Nutt.
Orobanche uniflora L.

PLANTAGINACEÆ.

Plantago Purshii R. & S.

RUBIACEÆ.

Galium boreale L.

CAPRIFOLIACEÆ.

Linnæa borealis L., var. *americana* Forbes.
Lonicera involucrata (Richards) Banks.

VALERIANACEÆ.

Valerianella macrocera T. & G.

CAMPANULACEÆ.

Specularia perfoliata (L.) A. DC.

COMPOSITÆ.

Chrysopsis hispida (Hook.) Nutt.
Chrysopsis villosa (Pursh) Nutt.
Solidago ellngata Nutt.
Erigeron macranthus Nutt.
Erigeron corymbosus Nutt.
Erigeron philadelphicus L.
Antennaria rosea Greene.
Gaillardia aristata Pursh.
Arnica cordifolia Hook.
Agoseris aurantiaca Hook.
Hieracium columbianum Rydb.
Sonchus arvensis L.
Crepis intermedia A. Gray.

PLANTS COLLECTED IN CHILCOTIN DISTRICT, 1915.

By W. A. NEWCOMBE.

(Identified by J. M. Macoun, C.M.G., Curator of Herbarium, Geological Survey, Ottawa.)

POLYPODIACEÆ.

Cheilanthes Feei Moore.
Cheilanthes gracillima D. C. Eaton.
Pellæa occidentalis (Nels.) Rydb. Alexis Creek.
Cryptogramma acrostichoides R. Br. Hell's Gate, Fraser River.
Crystopteris fragilis (L.) Bernh.
Woodsia obtusa (Spreng.) Torr.
Woodsia oregana D. C. Eaton. Hell's Gate, Fraser River.
Woodsia scopulina D. C. Eaton.

OPHIOGLOSSACEÆ.

Botrychium Lunaria L.

PINACEÆ.

Juniperus scopulorum Sarg.
Juniperus communis L., var. *sibirica* (Burgsd.) Rydb.

NAIADACEÆ.

Triglochin palustris L.

GRAMINEÆ.

Phragmites communis Trin.

CYPERACEÆ.

Eleocharis palustris (L.) R. & G.
Carex sp.?
Carex vesicaria L.

LILIACEÆ.

Zygadenus venenosus S. Wats.
Allium cernuum Roth.
Lilium parviflorum (Hook.) Holtz.
Fritillaria pudica (Ph.) Spreng.
Smilacina sessilifolia Nutt.

IRIDACEÆ.

Sisyrinchium angustifolium Miller.

ORCHIDACEÆ.

Cypripedium parviflorum Salisb.
Orchis rotundifolia Banks.
Habenaria obtusata (Ph.) Richards.
Habenaria dilatata (Ph.) Gray.

SALICACEÆ.

Salix ? myrtilloides L.
Salix melanopsis Nutt.
Salix sp.
Populus tremuloides Michx.
Populus trichocarpa T. & G.

BETULACEÆ.

Betula glandulosa Michx.
Alnus sp.

SANTALACEÆ.

Comandra pallida A. DC.

POLYGONACEÆ.

Eriogonum heracloides Nutt.

CHENOPODIACEÆ.

Chenopodium capitatum (L.) Ascher.

CARYOPHYLLACEÆ.

Stellaria longipes Goldie.
Cerastium arvense L.
Cerastium ? nutans Raf.
Silene Menziesii Hook.

RANUNCULACEÆ.

Ranunculus cymbalaria Pursh.
Ranunculus delphinifolius Torr.
Ranunculus sceleratus L.
Ranunculus Macounii Britt.
Ranunculus pedatifidus Smith.
Ranunculus abortivus L.
Ranunculus glaberrimus Hook.
Thalictrum occidentale A. Gray.
Anemone multifida Poir.
Aquilegia brevistyla Hook.
Delphinium bicolor Nutt.
Actæa arguta Torr.

FUMARIACEÆ.

Corydalis aurea Willd.

CURCIFERÆ.

Draba nemorosa L., var. *leiocarpa* Lindbl.
Sisymbrium incisum Engelm.
Erysimum cheiranthoides L.
Cardamine probably *pennsylvanica* Muhl.
Arabis brachycarpa (T. & G.) Britt.
Arabis lyrata L., var. *occidentalis* S. Wats.
Arabis hirsuta Scop.

CRASSULACEÆ.

Sedum stenopetalum Pursh.

SAXIFRAGACEÆ.

Heuchera columbiana Rydb.
Chrysosplenium alternifolium L.

Parnassia palustris L.
Ribes hudsonianum Richardson.
Ribes oxyacanthoides L.

ROSACEÆ.

Spiræa lucida Dougl.
Amelanchier florida Lindl.
Fragaria chiloensis (L.) Duch.
Potentilla gracilis Dougl.
Potentilla glandulosa Lindl.
Potentilla anserina L.
Potentilla anserina L., var. *concolor* Ser.
Potentilla pennsylvanica L.
Potentilla strigosa Pursh.
Geum rivale L.
Geum strictum Ait.
Geum triflorum Pursh.
Rubus strigosus Michx.
Rubus triflorus Richards.
Rubus arcticus L.
Rosa acicularis Lindl.
Prunus demissa Nutt.

LEGUMINOSÆ.

Astragalus alpinus L.
Astragalus campestris Gray.
Hedysarum boreale Nutt.
Vicia americana Muhl.
Lathyrus ochroleucus Hook.
Astragalus hypoglottis L.

LINACEÆ.

Linum Lewisii Pursh.

GERANIACEÆ.

Geranium erianthum DC.

VIOLACEÆ.

Viola adunca Smith.
Viola blanda Willd.
Viola canadensis L.
Viola cognata Greene.

ELÆAGNACEÆ.

Elæagnus argentea Pursh.
Shepherdia canadensis (L.) Nutt.

ONAGRACEÆ.

Epilobium angustifolium L.

UMBELLIFERÆ.

Cicuta ? vagans Greene.
Heracleum lanatum Michx.

CORNACEÆ.

Cornus stolonifera Michx.

ERICACEÆ.

Pyrola uliginosa Torr.
Arctostaphylos Uva-ursi (L.) Spreng.

PRIMULACEÆ.

Androsace saptentrionalis L.
Lysimachia thyrsiflora L.

APOCYNACEÆ.

Apocynum androsæmifolium L.

POLEMONIACEÆ.

Gilia linearis (Nutt.) Gray.
Polemonium elegans Greene.

HYDROPHYLLACEÆ.

Phacelia Menziesii (R. Br.) Torr.

BORAGINACEÆ.

Lappula Redowskii (Hornem.) Greene, var. *occidentalis* (Wats.) Rydb.
Lithospermum angustifolium Michx.
Lithospermum ruderale Dougl.

LABIATÆ.

Mentha arvensis L.

SCROPHULARIACEÆ.

Pentstemon Scouleri Lindl.
Pentstemon procerus Dougl.
Mimulus Langsdorfii Donn.
Mimulus pedunculatis Dougl.
Veronica americana Schwein.
Castilleja angustifolia (Nutt.) G. Don.
Castilleja miniata Dougl.
Orthocarpus luteus Nutt.

OROBANCHACEÆ.

Orobanche fasciculata Nutt.

RUBIACEÆ.

Galium boreale L.

CAPRIFOLIACEÆ.

Lonicera involucrata (Richard.) Banks.
Symphoricarpos racemosus Michx.
Linnæa borealis L.
Viburnum pauciflorum Pylaie.

VALERIANACEÆ.

Valeriana sitchensis Bong.

COMPOSITÆ.

Chrysopsis hispida (Hook.) Nutt.
Aster multiflorus Ait.
Erigeron flagellaris A. Gray.
Erigeron philadelphicus L.
Erigeron speciosus DC.
Erigeron compositus Pursh.
Antennaria lanata (Hook.) Greene.
Antennaria rosea Greene.
Antennaria parvifolia Nutt.
Balsamorhiza sagittata (Pursh) Nutt.
Gaillardia aristata Pursh.
Achillea Millefolium L.
Artemisia discolor Dougl.
Petasites speciosa (Nutt.) Piper.
Arnica alpina (L.) Ol. & Lad.
Arnica cordifolia Hook.

Senecio canus Hook.
Senecio cymbalarioides Nutt.
Senecio mutabilis Greene.
Cichorium Intybus L.
Agoseris glauca (Pursh) Steud.
Crepis occidentalis Nutt.

PALÆONTOLOGY.

A noteworthy addition to the small collection of Tertiary fossils in the Provincial Museum was acquired in October, 1916. This consists of a fossil tooth of the rare *Desmostylus*, an extinct race of the mammalian group of sirenians, to which the living dugong and the recently extinct Steller's sea-cow belong.

The tooth referred to was found by Miss M. Egerton, of Victoria, in the fossiliferous sandstone cliff near the mouth of Coal Creek, Sooke, in the summer of 1916, and was forwarded by R. E. Gosnell, at the suggestion of the Director, to Lawrence M. Lambe, Dominion Vertebrate Palæontologist, Ottawa, for determination. Mr. Lambe's reply included the following statement:—

"The tooth from Otter Point, in the Sooke District, Vancouver Island, belongs to the sirenian species, *Desmostylus hesperus* Marsh, of Pliocene (? Miocene) age. This tooth is of particular interest as it is the first one of this kind found to our certain knowledge in Canada. Last year Dr. Newcombe, of Victoria, B.C., presented to this Department a large, perfect, unworn tooth which he obtained from a curio-dealer, and was supposed to be from Alaska. Miss Egerton's specimen was happily secured *in situ*, and possibly a further search at the locality may reveal other remains of the species. It appears to be the first right upper molar; Dr. Newcombe's being the second left molar. It is probable that the beds from which the specimen comes are of Miocene age, but the genus may have ranged up into the Pliocene. Remains of *Desmostylus* have been found in Japan, California, and Oregon. The genus is closely related to the existing *Manatus* of Florida and the recently extinct *Rhytina* (Steller's sea-cow) of the North Pacific. The specimen has been broken off at the top of the roots, which have remained in the rock, and may possibly still be recovered to make it complete if a visit is made to the locality and care is exercised in their removal."

As several finds of *Desmostylus* had been reported from California, from which State the first specimen had been described, it was thought advisable to write to the well-known geologists, Dr. Merriam and Dr. Ralph Arnold, for further information. The former had already taken much interest in the Sooke formations and had published preliminary descriptions of fossils found in them in 1897 and 1899. In the years 1906 and 1911 he had also published notes on the genus *Desmostylus*, with special reference to the remains found on the Pacific Coasts of America and Japan. Dr. Arnold, it was known, had devoted a great deal of time to the Tertiary faunas of the Pacific Coast, and had in view a publication which might continue the work so well commenced by his report on the Marine Pliocene and Pleistocene of San Pedro, California. Dr. Arnold had also sent field parties to our Coast, who had made large collections of fossils at and near Sooke.

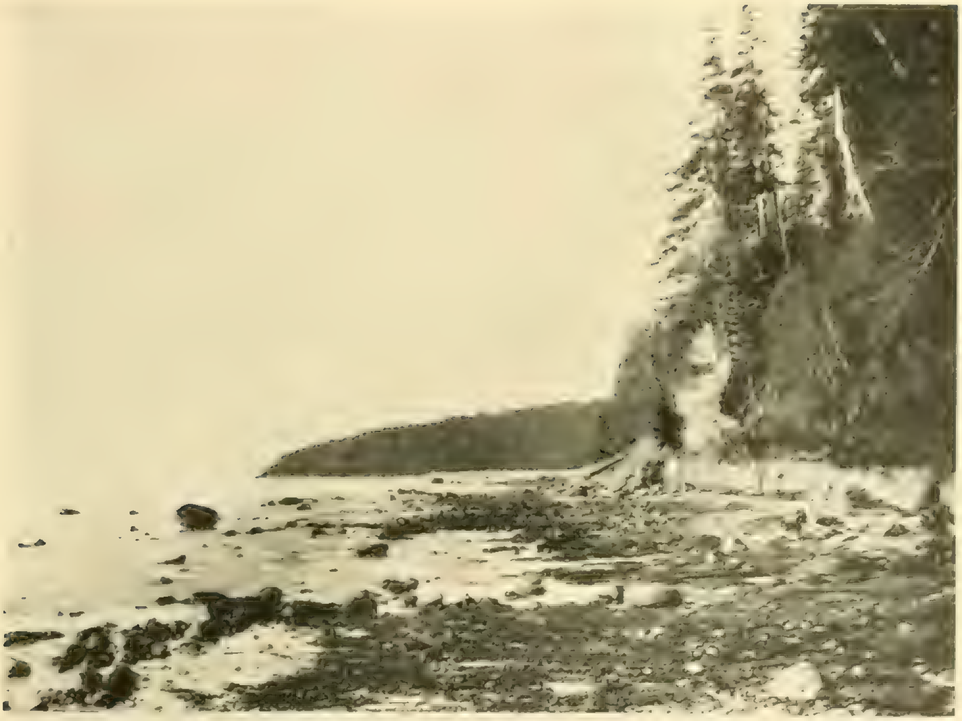
Permission was readily given to make use of such conclusions as had been arrived at by the above geologists with regard to the age of the formation from which our *Desmostylus* tooth came.

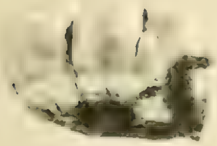
Quoting from a letter received from Mr. B. L. Clark, of the University of California, who is now examining and describing the Tertiary fossils of this Coast in collaboration with Drs. Merriam and Arnold, the following statements are of interest:—

"After studying the fauna from the Sooke beds and that from the Carmanah Point beds, my conclusion is that they belong to the same period of deposition and, very probably, to the same faunal horizon. A number of species common to the beds of the two localities are distinctive forms, such as, I believe, may be taken as good horizon markers. Some of these species are *Agasoma acuminatum*, *Bullia buccinoides*, *Eudolium petrosu*, *Molopophorus Newcombei*, *Macrocallista vancouverensis*, and *Chione ? n. sp.*

This fauna, from both localities, apparently belongs to the same horizon as that found in the Restoration Point beds near Seattle. These were referred to the Seattle formation by Arnold and Hannibal, and to his Blakely horizon by Weaver, the fauna of which he designates as that of the *Acila gettysburgensis* zone.

PLATE IX





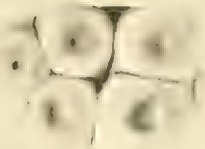
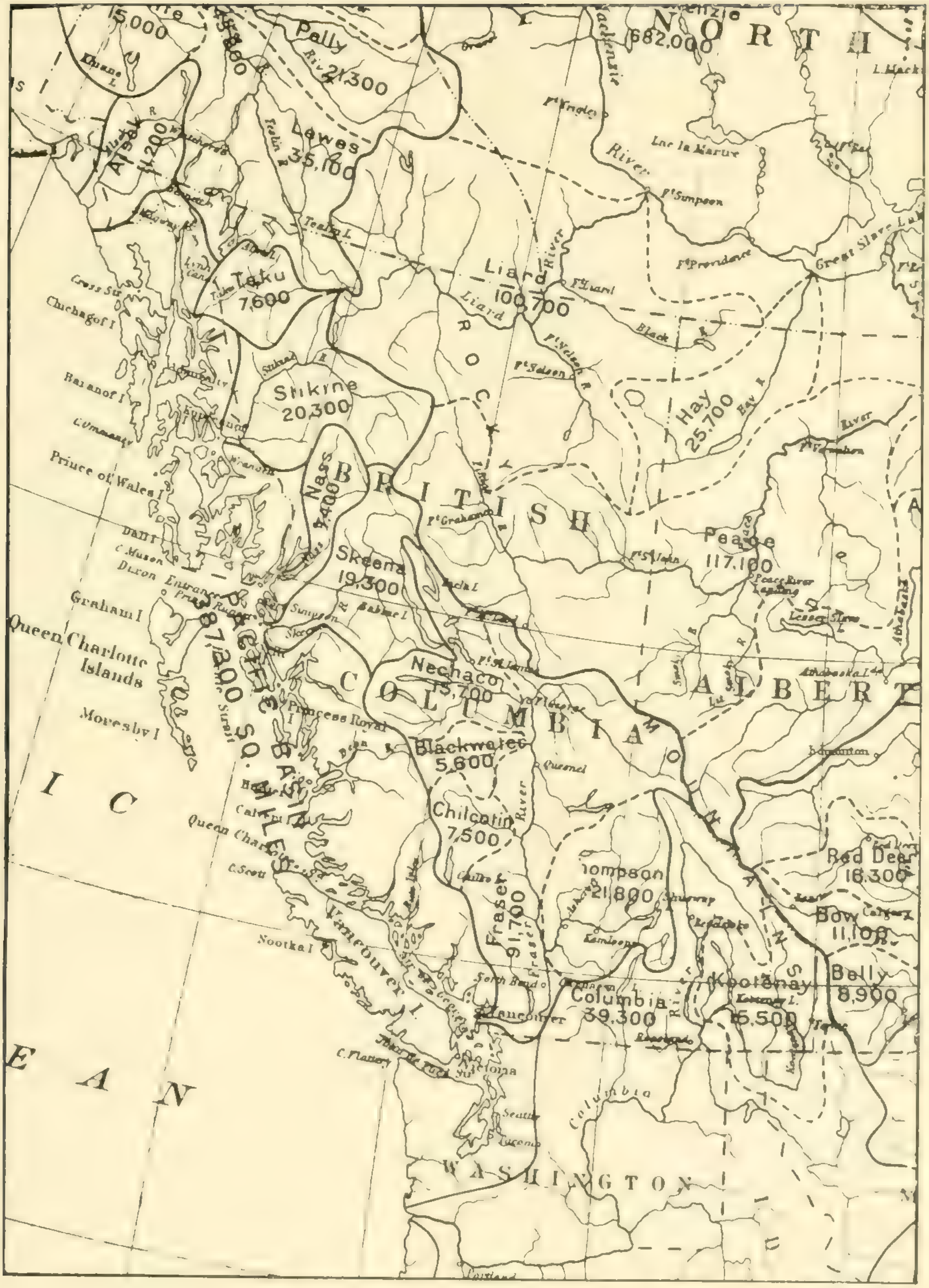


Fig. 1. View of fossiliferous sandstone cliff near mouth of Coal Creek, Sooke, Vancouver Is
Photo by C. F. Newcombe, M.D

Figs. 2 and 3 Tooth of *Desmostylus hesperus* Marsh. Found in the sandstone cliffs near mouth
Coal Creek, Sooke, B.C.

PLATE X



NORTH
682,000
Pelly
21,300
Lewes
35,100
Alsek
11,200
Taku
7,600
Liard
100,700
Shikine
20,300
Hay
25,700
Nass
7,400
BRITISH COLUMBIA
Skeena
19,300
Peace
117,100
Nechaco
15,700
PACIFIC SQ. MILES
87,300
Blackwater
5,600
Chilcotin
7,500
Thompson
21,800
Fraser
91,700
Red Deer
16,300
Bow
11,100
Belly
8,900
Kootenay
15,500
Columbia
39,300
ALBERTA
ROCKY MOUNTAINS
WASHINGTON
OCEAN
Queen Charlotte Islands
Graham I
Moresby I
Prince of Wales I
Baranof I
Chichagof I
Vancouver I.
Nootka I
C. Scott
C. Flattery
Dixon Entrance
Prince Rupert
Princess Royal I
Queen Charlotte Sd
Great Slave Lake
Ft Simpson
Ft Providence
Ft Liard
Ft Nelson
Ft St John
Peace River Landing
Lesser Slave L
Athabaska L
Edmonton
Calgary
Quesnel
Kamloops
Vancouver
Victoria
Seattle
Tacoma
Portland
Teslin L
Kluane L
Lac la Martre

Drainage-basins of British Columbia
Enlarged from Atlas of Canada, Department of the Interior

"The question as to the exact position of the *Acila gettysburgensis* zone is debatable. Professor Weaver places it as the uppermost faunal zone of the Oligocene.

"My study of the Oligocene fauna of middle California, together with that of Oregon and Washington, appears to me to show that the faunas of the different horizons of the Oligocene of Oregon and Washington, as recognized by Arnold and Hannibal, and by Weaver, are very closely related. Much more work, however, must be done before the sequence and relative importance of the different faunal zones can be established for a certainty."

Plate IX., Fig. 1. View of fossiliferous sandstone cliff near the mouth of Coal Creek, Sooke. The low Tertiary cliff is covered by heavy glacial deposits with heavy growth of timber. Erosion is going on with great rapidity, leaving ice-worn boulders on nearly level rocky beach, which extends far out to sea at low water.

Plate IX., Figs. II. and III. Tooth of *Desmostylus*, believed to be of the species *hesperus* of Marsh. The tooth is formed of several cylindrical pillars, each consisting of a thick layer of enamel enclosing a small body of dentine. The grinding surface shows a circular depression at the end of each of the principal pillars, the lip of which is formed by enamel, and the central pit is excavated by wear into the softer dentine.

Until this tooth was found the *Desmostylus* was only known to occur in America in Oregon and California; outside of America it has also been found in Japan.

A. Side view of tooth showing pillars.

B. Grinding surface, showing circular pits. Height, 22 mm.; length, 35 mm.; width, 24 mm.

ACCESSIONS—PUBLICATIONS OF OTHER INSTITUTIONS.

SMITHSONIAN INSTITUTION, WASHINGTON, D.C.

1-566. Ext. Proc. No. 2117, Vol. 49—A New Crustacean (Diaptomus). C. Dwight Marsh.

1-567. Ext. Proc. No. 2119, Vol. 49—British Fossil Insects. T. D. A. Cockerell.

1-568. Ext. Proc. No. 2121, Vol. 49—Crested Tern, Thalasseus bergii (Lichenstein), Oberholser.

1-569. Ext. Proc. No. 2122, Vol. 49—Three New Species of Adodontites from Brazil. Wm. B. Marshall.

1-570. Ext. Proc. No. 2123, Vol. 49—Crustacea, Santa Marta, Colombo. A. S. Pearse.

1-571. Ext. Proc. No. 2124, Vol. 49—Molluscan Sub-genus Nucella of the North-west Coast of America and Adjacent Regions. Wm. Healey Dall.

1-572. Ext. Proc. No. 2126, Vol. 49—New Fresh-water Shells, Ozark Mountains. Anson A. Hinkley.

1-573. Ext. Proc. No. 2127, Vol. 49—Osteology of Thescelosaurus, an Orthopodous Dinosaur from the Lance Formation of Wyoming. Charles W. Gilmore.

1-574. Ext. Proc. No. 2129, Vol. 49—The Euphausiacean Crustaceans of the "Albatross" Expedition to the Philippines. H. J. Hansen.

1-575. Ext. Proc. No. 2135, Vol. 50—New Species Crabs. Mary J. Rathbun.

1-576. Ext. Proc. No. 2137, Vol. 50—Two New Species Fossil Turtles, Wyoming. C. W. Gilmore.

1-577. Ext. Proc. No. 2138, Vol. 50—Description of Three Species of Crabs, Eastern Coast of North America. Mary J. Rathbun.

1-561. U.S. National Herbarium, Vol. 16, Pt. 14—Plant Records, Lower California. E. A. Goldman.

1-562. U.S. National Herbarium, Vol. 17, Pt. 7—Tropical American Ferns. W. R. Maxon.

1-563. U.S. National Herbarium, Vol. 17, Pt. 8—Cacao and Patashitem. O. F. Cook.

1-564. U.S. National Herbarium, Vol. 18, Pt. 3—Tropical American Phanerogams, No. 2. Standley.

1-565. U.S. National Herbarium, Vol. 18, Pt. 4—New Plants from Colombia and Central America. Pittier.

1-578. Bull. No. 50, Museum—Birds of North and Middle America. Robt. Ridgway.

1-579. Bull. No. 93, Museum—Sessile Barnacles (Cirripedia) in U.S. National Museum Collection. Henry A. Pilsbry.

1-580. Bull. No. 94, Museum—Hand-book of the Meteorite Collection. Geo. P. Merrill.

1-581. Misc. Collection, Vol. 66, No. 8—Three New African Shrews, Genus Crocidura. N. Hollister.
1-582. Misc. Collection, Vol. 64, No. 5—Cambrian Trilobites. Charles D. Walcott.
1-583. Misc. Collection, Vol. 66, No. 1—African Mammals, New Genus and Species. N. Hollister.
1-584. Misc. Collection, Vol. 66, No. 10—Murine Rodents from Africa. N. Hollister.
1-585. Misc. Collection, Vol. 66, No. 12—Bones of Mammals, Cuba and Santo Domingo. G. S. Miller.
1-586. Misc. Collection, Vol. 66, No. 13—Teeth of Monkey in Cuba. G. S. Miller, Jr.
1-587. Ext. Proc. No. 2142, Vol. 51—Philippine Titmouse, Ed. Alex. Mearns.
1-588. Ext. Proc. No. 2146, Vol. 51—American Fossil Insects. T. D. A. Cockerell.
1-589. Ext. Proc. No. 2147, Vol. 51—Two Extinct Mammals, Texas. O. P. Hay.
1-590. Ext. Proc. No. 2155, Vol. 51—Two New Land Shells from the Western States. P. Bartsch.
1-591. Contributions, Herbarium, Vol. 16—Investigations in Ferns, Mosses, Phanerogams.

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21-61. Bull., Vol. XXXIV., Art. XXII.—New South American Mammals. J. A. Allen.
21-62. Bull., Vol. XXXV., Art. XI.—New South American Mammals. J. A. Allen.
21-63. Bull., Vol. XXXV., Art. XII.—The Neotropical Weasels. J. A. Allen.
21-64. Bull., Vol. XXXV., Art. XIII.—List of Mammals collected for the American Museum in Ecuador by William B. Richardson, 1912-13. (Allen.)
21-65. Bull., Vol. XXXV., Art. XVII.—Some Apparently Undescribed Birds from the Collection of the Roosevelt South American Exped. Geo. K. Cherrie.
21-66. Bull., Vol. XXXV., Art. XVIII.—List of Mammals collected in Colombia by the American Museum Expeditions, 1910-15. J. A. Allen.
21-67. Bull., Vol. XXXV., Art. XXIX.—On Dysithamnus mentalis and its Allies. W. E. Clyde Todd.
21-68. Bull., Vol. XXXV., Art. XXX.—Mammals collected on the Roosevelt Brazilian Expedition, with Field-notes by Leo. E. Miller.
21-69. Bull., Vol. XXXV., Art. V.—The Proper Generic Name of the Macaques. J. A. Allen.
21-70. Bull., Vol. XXXV., Art. VI.—Habits of Aplodontia. H. E. Anthony.
21-71. Bull., Vol. XXXV., Art. XX.—Panama Mammals collected in 1914-15. H. E. Anthony.
21-72. Bull., Vol. XXXV., Art. XXVII.—New Mammals collected on the Roosevelt Brazilian Expedition. J. A. Allen.
21-73. Bull., Vol. XXXV., Art. XII.—New Family Insectivories. H. E. Anthony.

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2-275. N.A. Fauna No. 40—A Systematic Account of the Prairie-dog. N. Hollister.
2-276. Bull. No. 34—Birds of Porto Rico. Alex. Wetmore.
2-277. Farmers' Bull. No. 702—Cottontail Rabbits in relation to Trees, Farm Crops. D. E. Lantz.
2-278. (Bureau of Education)—Educational Work of Museum, 1915. P. M. Rea.
2-279. (Bureau of Biological Survey)—Service and Regulatory Announcements: Bird Protection.
2-280. Farmers' Bull. No. 706—Laws relating to Fur-bearing Animals, 1915. D. E. Lantz.
2-281. Report of Chief of Bureau of Biological Survey, 1915.
2-282. Bull. No. 396—Second Annual Report of Bird Counts in United States. W. W. Cooke.

CALIFORNIA ACADEMY OF SCIENCES.

8-97. 4th Series, Vol. VI., Nos. 1, 2, 3—1. Eocene of the Lower Cowlitz River Valley, Wash. 2. The Post-Eocene Formation of Western Wash. 3. The Oligocene of Kitsap Co., Wash. Charles Weaver.
8-98. 4th Series, Vol. VI., Nos. 7, 8—Report of the President for 1915. Report of the Director for 1915.

8-99. 4th Series, Vol. VI., No. 4—The Pacific Coast Races of the Bewick Wren. Harry S. Swarth.

8-100. 4th Series, Vol. VI., No. 5—Monograph of the North American Species of Orthotylus (Hemiptera). Edward P. Van Duzee.

8-101. 4th Series, Vol. VI., No. 6—A Catalogue and Host List of Anoplura. G. F. Ferris.

8-102. 4th Series, Vol. VI., No. 7—Four Species of Salamanders new to the State of California, with Description of Plethodon elongatus, a New Species, and Notes on other Salamanders. John Van Denburgh.

University of California.

9-109. Vol. 12, No. 13—Report upon Mammals and Birds found in Portions of Trinity, Siskiyou, and Shasta Counties, Calif. Louise Kellogg.

9-109. Vol. 12, No. 14—Analysis of the Vertebrate Fauna of the Trinity Region. Joseph Grinnell.

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9-111. Vol. 12, No. 16—Two New Aplodontias from Western North America. W. P. Taylor.

9-112. Vol. 12, No. 17—Local Distribution and Habits of the Amphibians and Reptiles of South-eastern California in the Vicinity of the Turtle Mountains. Chas. Lewis Camp.

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9-114. Vol. 15—Introduction, Dependence of Marine Biology upon Hydrography and Necessity of Quantative Biological Research. Ellis L. Michael.

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9-116. Vol. 16, No. 4—The Cultivation of Tissues from Amphibians. J. C. Johnson.

9-117. Vol. 16, No. 5—Notes on the Tintinnoina. Chas. Atwood Kofoid.

9-118. Vol. 16, Nos. 6, 7—6. Binary and Multiple Fission in Hexamitus. Olive Swezy. 7. On a Trichomonad Flagellate, Trichomitus Parvus, from the Intestine of Amphibians. Olive Swezy.

9-119. Vol. 16, No. 8—On Blepharocorys equi sp. nov., a New Ciliate from the Cæcum of the Horse. Irwin C. Schumacher.

9-120. Vol. 16, No. 9—Three New Helices from California. S. Stillman Berry.

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9-124. Vol. 16, No. 13—Notes on the Marine Fishes of California. Carl L. Hubbs.

9-125. Vol. 16, No. 14—The Feeding Habits and Food of Pelagic Copepods and the Question of Nutrition by Organic Substances in Solution in the Water. Calvin O. Esterly.

9-126. Vol. 16, No. 15—The Kinetonucleus of Flagettates and the Binuclear Theory of Hartmann. Olive Swezy.

9-127. Vol. 16, No. 16—On the Life-history of a Soil Amœba. Chas. Woodruff Wilson.

9-128. Vol. 17, Nos. 1, 2—1. Diagnoses of Seven New Mammals from East-Central California. Jos. Grinnell and Tracy I. Storer. 2. A New Bat of the Genus Myotis from the High Sierra Nevada of California. Hilda Wood Grinnell.

9-129. Vol. 17, No. 3—Spelerpes platycephalus, a New Alpine Salamander from the Yosemite National Park, California. Chas. Lewis Camp.

9-130. Vol. 17, No. 4—A New Spermophile from the San Joaquin Valley, California, with Notes on Ammospermophilus nelsoni nelsoni Merriam. W. P. Taylor.

9-132. Vol. 17, No. 5—Habits and Food of the Roadrunner in California. H. C. Bryant.

9-133. Vol. 17, No. 6—Descrip. Bufo. canorus, a New Toad from Yosemite National Park. C. L. Camp.

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3-157. Memoir 50—Upper White River District, Yukon. D. D. Cairns.
3-158. Memoir 55—Geology of Field Map-area, British Columbia and Alberta. John A. Allen.
3-159. Memoir 58—Texada Island. R. G. McConnell.
3-160. Memoir 60—Arisaig-Antigonish District, Nova Scotia. M. Y. Williams.
3-161. Memoir 72—The Artesian Wells of Montreal. C. L. Cumming.
3-162. Memoir 76—Geology of Cranbrook Map-area, British Columbia. Stuart J. Schofield.
3-163. Memoir 77—Geology and Ore Deposits of Rossland, British Columbia. C. W. Drysdale.
3-164. Memoir 79—Ore Deposits of the Beaverdell Map-area. Leopold Reinecke.
3-165. Memoir 80—Huron and Wyandot Mythology (Anthropology). C. M. Barbeau.
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3-167. Memoir 83—Upper Ordovician Formations, Ontario and Quebec. A. F. Foerste.
3-168. Memoir 87—Geology of a Portion of the Flathead Coal Area, British Columbia. J. D. MacKenzie.
3-169. Memoir 88—Geology of Graham Island, British Columbia. J. D. MacKenzie.
3-170. Fourteenth Report of the Geographic Board of Canada.
3-171. Summary Report of the Geoelogical Survey, Department of Mines, 1915.
3-172. Museum Bulletin No. 22, Geol. Series 31—The Age of Killarney Granite. W. H. Collins.
3-173. Reprint from Transactions of the Royal Society of Canada—Bibliography of Canadian Entomology, 1913. Rev. Prof. C. J. S. Bethune, D.C.L.
3-174. Reprint from Transactions of the Royal Society of Canada—Bibliography of Canadian Entomology, 1914.
3-174. Commission of Conservation—Museums as Aids to Forestry. H. I. Smith.
3-175. Memoir 51—Geology of the Nanaimo Map-area. Chas. H. Clapp.
3-176. Memoir 73—Pleistocene and Recent Deposits of the Island of Montreal. J. Stansfield.
3-177. Memoir 90—Time Perspective in Aboriginal American Culture. E. Sapir.
3-178. Supplementary List of Publications of the Geological Survey, 1912.
3-179. Museum Bull. No. 23—The Trent Valley Outlet of Lake Algonquin. W. A. Johnston.
3-180. Museum Bull. No. 24—Late Pleistocene Oscillations of Sea-level in Ottawa Valley. W. A. Johnston.
3-171. Report of the Work of Public Archives, 1914 and 1915. A. G. Doughty.

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42-14. Vol. XIV., No. 2—University Studies.
42-15. Vol. XV., No. 1—University Studies.
42-16. Vol. XV., No. 2—University Studies.
42-17. Vol. XV., Nos. 3, 4—University Studies.
42-18. Vol. XVI., Nos. 1, 2—University Studies.
42-19. Vol. XVI., No. 3—University Studies.

OHIO AGRICULTURAL EXPERIMENT STATION.

16-149. Circular No. 153—Mushrooms.
16-150. Circular No. 154—Insect Pests of the Greenhouse.
16-151. Circular No. 155—County Experiment Farm Law (House Bill 163).
16-152. Circular No. 156—To disinfect Tobacco-beds from Root-rot Fungus.
16-153. Technical Series, Bull. 6—Metabolism of Phosphorus.
16-154. Technical Series, Bull. 8—Phosphorus in Plant and Animal Substance.
16-155. Bull. 277—Ohio Weather for 1913.
16-156. Bull. 280—Animal Parasites affecting Ohio Live Stock.
16-157. Bull. 281—Summer Treatment of Greenhouse Soil.
16-158. Bull. 282—Corn Experiments.
16-159. Bull. 283—Swine.
16-160. Bull. 284—Fattening Roasters and Capons.
16-161. Bull. 285—Tobacco.
16-162. Bull. 286—Reports, County Experiment Farms, 1914.

16-163. Bull. 287—Ohio Weather for 1914.
16-164. Bull. 288—Thirty-fourth Annual Report.
16-165. Bull. 289—Dairy Heifers.
16-166. Bull. 290—Apples.
16-167. Bull. 295—Mineral Metabolism of the Milch Cow.
16-168. Bull. 299—Iodine Contents of Foods.

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15-53. Report, 1914-15.
15-54. General Guide.

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18-55. Zool. Series, Pub. 189, Vol. X., No. 14—Mammals, Collins-Day, S. A. Exped. W. Hlosgood.
18-56. Ornth. Series, Pub. 190, Vol. 1, No. 10—New South American Birds. Charles B. Cory.

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28-20. Birds in their Economic Relation to Man. Richard C. McGregor.

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37-6. Proceedings, Vol. IX., 1915.

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41-24. Series No. 89—Annual Report, 1916.
41-25. Founders' Day. 1916.

PROVINCE OF ONTARIO: REPORTS.

43-9. Annual Arch. Report, 1915.

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62-12. Directors' Report, 1913.
62-13. Directors' Report, 1915.

NEW YORK ZOOLOGICAL SOCIETY, N.Y.

58-7. Zoological, Vol. II., Nos. 3, 4—Birds of Para, Brazil. Fauna of 4 square feet of Jungle Debris. C. W. Beebe.
58-8. Zoological, Vol. II., No. 5—The Gaff-topsail. E. W. Gudger.
58-9. Zoopathologica, Vol. I., No. 1—Some New Species of Parasitic Trematodes of Marine Fishes. G. A. McCallum, M.D.
58-10. Report of the Director of the Aquarium.

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55-321. Proceedings, Numismatic and Antiquarian Society of Philadelphia. Vol. 27.
55-322. Bulletin of the New York Botanical Garden, 1915.
55-323. Frederick Ward Putnam, 1839-1915. An Appreciation by Edward S. Moore.
55-324. Grand Rapids Public Library—Annual Report, 1915-16.
55-325. Charleston Museum Publications, 1916.
55-326. The Dominion Experimental Farms—"Seasonable Hints." November, 1916.
55-327. Commonwealth of Massachusetts—Annual Report State Ornithologist, 1915. E. Howe Forbush.
55-328. Illinois State Museum of Natural History—General Guide, 1914.
55-329. Illinois State Laboratory, Vol. X.—Contents and Index.
55-330. Illinois State Laboratory, Vol. XI., Art. No. II.—Prairie and Forest Invertebrates. C. C. Adams.
55-331. Illinois State Laboratory, Vol. XI., Art. III.—Veterbrate Life of Prairie and Forest Regions near Charleston, Ill. T. L. Hankinson.

55-332. Illinois State Laboratory, Vol. XI., Art. IV.—Add. Records of Chironomidæ for Ill. and other Diptera. Jon. R. Malloch.
55-333. Illinois State Laboratory, Vol. XI., Art. V.—Phyllophaga Harris. Robt. E. Glasgow.
55-334. Illinois State Laboratory, Vol. XII., Art. I.—The Relation of Evaporation and Soil Moisture to Plant Succession. F. T. Ullrich.
55-335. Illinois State Laboratory, Vol. XII., Art. II.—A Classification of the Lepidoptera. Mosher.
55-336. Louisiana State Museum. Report of the Board of Curators, 1915.
55-337. Philadelphia Museums—Report, 1915.
55-338. Legislative Assembly of Ontario—Archæological Report, 1915.
55-339. Winnipeg Industrial Bureau—Report, 1915.
55-340. N.Y. Academy of Sciences, Vol. XXVII., pp. 193-203—Preliminary Report of Fossil Mammals from Porto Rico. H. E. Anthony.
55-341. Manx Museum—Annual Report, 1916.
55-342. Zoological Society of Philadelphia—Report, 1916.
55-343. National Museum, Melbourne—Memoir 6.
55-344. National Museum, Melbourne, No. 1—Carboniferous Fish Fauna. A. S. Woodward.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1917.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1917

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

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1918.

To His Honour Sir FRANK STILLMAN BARNARD, K.C.M.G.,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Provincial Museum of Natural History for the year 1917.

J. D. MACLEAN,
Provincial Secretary.

Provincial Secretary's Office, Victoria,
March 7th, 1918.

Provincial Museum of Natural History,
Victoria, B.C., March 7th, 1918.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1917, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1917.

Since the last Annual Report of the Provincial Museum it has been found that it was still necessary that the strictest economy must be exercised in the maintenance of public institutions, expending moneys only where it was absolutely necessary, and still keep up to the objects of the "Provincial Museum Act," viz.:—

(*a.*) To secure and preserve specimens illustrating the natural history of the Province:
(*b.*) To collect anthropological material relating to the aboriginal races of the Province:
(*c.*) To obtain information respecting the natural sciences relating particularly to the natural history of the Province, and to increase and diffuse knowledge regarding the same.

Although quite a large number of specimens have been added to the collection during the year, little actual field-work was undertaken, as at the usual time to start field-work it was not possible to secure the desired assistants.

However, Dr. C. F. Newcombe, who has always been only too willing to assist in building up the collections of the Provincial Museum, offered his services voluntarily, and accompanied the Director on a trip to the Bella Coola District in the month of June.

While in Bella Coola special efforts were made to collect the flora of the district, as this was particularly needed in mapping out the distribution of the different species of plants in this Province. Quite a large representative collection was secured and prepared, of which special mention is made in the botanical report. A number of plants were also collected at Ocean Falls while waiting there for a steamer to Victoria.

Advantage was also taken of the information conveyed to the Director by Mr. W. H. Gibson, the missionary at Bella Coola, that he thought it would be possible to secure a number of old ceremonial masks, which had been in possession of the tribe for a great number of years, from an old Indian chief, "Captain Schooner."

Dr. Newcombe and the Director paid several visits to the old reserve to see the old chief, and after using a great deal of diplomacy and secrecy (which is necessary when dealing with Indians in such matters, especially with chiefs), these ceremonial masks were secured with their stories and legends.

In the month of April the Department was fortunate in purchasing from Lieutenant F. C. Swannell, B.C.L.S., of Victoria, a collection of Indian relics from the Northern Interior of the Province, from which locality the Museum had very little material; these specimens belonged to a number of tribes, which, like others, are fast disappearing. Lieutenant Swannell had collected these specimens several years ago while out with survey parties in the northern portions of the Province.

Two very valuable collections of anthropological material were donated to the Museum, one by Mrs. Gertrude A. Croucher, Yale, B.C., in memory of her much respected husband, the late Rev. Charles Croucher. This collection, numbering 158 specimens, was collected by Rev. Mr. Croucher many years ago, and has been much coveted by a number of the museums of America; but the late reverend gentleman was loyal to this Province, and would not allow his collection to go out of British Columbia, and always said that at his death the specimens were to be donated to the Provincial Museum at Victoria, so that they would be accessible to students in the study of the life-history of the aboriginal races of this North-west Coast of America.

The other anthropological collection, numbering eight specimens, was donated by Mrs. Blanche Dewdney, in memory of her late husband, the Honourable Edgar Dewdney, P.C., ex-Lieutenant-Governor of the North-west Territory and ex-Lieutenant-Governor of the Province of British Columbia. In this collection will be found a valuable set of bone gambling-dice, with sticks as counters, used by the Kootenay Indians. Specimens similar to these are seldom seen in any collection of anthropology.

Early in the month of October, Professor John Macoun, F.R.S.C., Naturalist to the Geological Survey of Canada, Ottawa, who now resides at Sidney, B.C., received permission from the Director of the Geological Survey, Mr. R. G. McConnell, to present to the Provincial Museum his fine collection of the Vancouver Island flora, numbering approximately 900 specimens, all named and classified. The Director undertook to transfer these specimens personally from Sidney to Victoria, so that they would be handled with the greatest care. These specimens have now been deposited in the Herbarium under the supervision of Mr. W. R. Carter, and are now available for reference to those who are interested in the study of botany.

It will be seen in the report on botany that special work has been carried out in this particular branch during the past year, with the assistance of several volunteer collectors, who have helped materially to make the Herbarium the most representative collection in the Province.

The exhibition cases of British Columbia butterflies on the second floor of the Museum have been entirely rearranged by Mr. E. H. Blackmore, of this city, in accordance with the new Check-list of the Lepidoptera of Boreal America, issued by Messrs. Barnes and McDunnough, of Decatur, Ill., in February, 1917. This list is recognized as the standard authority by the Victoria Memorial Museum at Ottawa, and also by the majority of the principal museums in the United States.

The nomenclature has undergone radical changes and the sequence of genera is entirely different to that of Dr. Dyar's catalogue of North America Lepidoptera, published in 1902, which has hitherto been followed. The style of labelling has been altered, the names being typewritten in two colours, the generic and specific names in purple and the author's name in red, thus ensuring greater legibility than was formerly the case in the old hand-written labels. The labels are also placed on the supporting pin at the same height as the insect, thereby rendering them more easily readable to the general public. It is hoped to be able to continue this work on the Museum collection of moths during the coming year.

It is very gratifying to note that a number of teachers, both in public and private schools, are bringing their classes to the Museum in connection with their nature-studies, which I am sure has been greatly appreciated by the scholars, and without doubt has been a great benefit to them individually, judging from the manner in which they have gone around the exhibition halls taking notes. The Director or one of the staff is always on hand to give the young folk all the information possible.

The number of visitors that have signed the register in the entrance hall during the year 1917 was 35,672; this does not give the number of visitors by any means, as the school-children are not asked to register their names, neither are a large number of Orientals and others.

The Director has had a number of requests from other museums, societies, and persons who are interested in the several branches of natural sciences for the loan of specimens for comparison, which has always been willingly granted whenever possible.

By permission of the Honourable Provincial Secretary, the annual meeting of the British Columbia Entomological Society was held in the Botanical Room in the Provincial Museum, when a number of very interesting papers were read by members on systematic and economic entomology.

The Honourable Minister of this Department also gave the Director permission to have the meetings of the Natural History Society held in the Museum on evenings when subjects are being discussed on natural-history specimens that are represented in the collections; this arrangement is most satisfactory, as it saves loaning specimens, and I think is of more interest to members and has been greatly appreciated by the society.

The Director wishes to extend grateful thanks to the following persons that have assisted with the identifications in their respective branches of biology:—

Identification of Botanical Specimens.—Professor J. Macoun, Sidney, B.C.; J. M. Macoun, C.M.G., Chief of Biological Department, Ottawa; C. F. Newcombe, M.D., Victoria; and Professor J. K. Henry, University of British Columbia, Vancouver, B.C.

Identifications in Entomology.—Doctors Barnes and McDunnough, Decatur, Ill.; Professor E. M. Walker, University of Toronto, Ont.; L. W. Swett, Lexington, Mass.; R. S. Sherman, Vancouver, B.C.; and E. H. Blackmore, Victoria, B.C.

Thanks are also extended to a number of persons who have donated specimens.

Botanical specimens have been received from the following: Professor J. Macoun, Sidney; W. B. Anderson, Victoria; Dr. C. F. Newcombe, Victoria; W. R. Carter, Alberni; W. A. Newcombe, Victoria; J. R. Anderson, Victoria; and Professor J. K. Henry, Vancouver.

Notes on bird observations have been received from the following: J. E. Kelso, M.D., and W. B. Johnson, Lower Arrow Lakes; A. H. Palmer, New Westminster; J. A. Munro, Okanagan Landing; and others.

BARE ISLAND BIRD SANCTUARY.

(This island is known as Indian Reserve No. 9, Saanich Tribe, and is situated in Haro Strait about twenty miles north-east of Victoria.)

Owing to certain conditions it was not deemed advisable to place a warden on this island during the last nesting season, and it was expected that after this island had been guarded so closely for the two previous seasons, and persons warned to keep away, no person would go there to molest the gulls, guillemots, puffins, and cormorants that make this island their nesting ground.

But in a report that was sent to me by Mr. Leonard S. Higgs, who lives on one of the neighbouring islands, it seems imperative that a guard must be maintained on Bare Island during the nesting season and continued indefinitely. The following is a quotation from his letter:—

"As perhaps you know, I take a deep interest in the few sea-bird breeding-places in the neighbourhood, and especially in that on Bare Island, which I have visited practically every summer for twenty-five years.

"The policy of the Government in placing a warden on Bare Island for a couple of months during the breeding-season was admirable, and was responsible for raising the number of breeding pairs to at least double what it was two or three years ago. But it is a policy which should be continued indefinitely.

"My experience this summer has been as follows: I visited the island early in June, when the nests were just made, and contained either one or two eggs. I counted over 100 eggs in an area perhaps equal to one-thirtieth of the breeding-ground, taking an average of one egg and a half to each nest at that time. When the full hatches should have been laid, the number of eggs available for hatching should have been 6,000. I called again after an interval of ten days, and should have had difficulty in finding 100 eggs upon the entire island, practically every nest being empty. No bird, however prolific, can stand such treatment."

ANTHROPOLOGY.

Accessions, 1917.

By Purchase from Lieutenant F. C. Swannell (Nos. 2912-2964).

1. Athabascan. From the Northern Interior of British Columbia. This portion of the collection consists of 100 specimens which were acquired by Lieutenant Swannell at the following localities: Lac la Hache, Chestalla Lake, Fraser Lake, Stuart Lake, Stella Lake, and the Babine River country. It consists principally of articles of stone, such as arrow and spear points, knives, chisels, skin-scrapers, hammers, pipes, and a polished mirror. There are also snow-shoes, bone skin-scrapers, adzes, fish-spears, knives with iron blades, and birch-bark baskets.

2. Salishan. From Lillooet seventeen specimens include a two-handed stone pile-driver of the rare type, illustrated in last year's report. There are also a few specimens from the Lower Fraser River, Victoria, and the Bella Coola region belonging to this stock.

Rev. C. Croucher Collection, mostly from Yale, B.C. (Nos. 2979-3137).

2996 to 2999 and 3137. A remarkable set of carved stone dishes. Of these, No. 2996 is of soapstone in a very fine state of preservation. Like Nos. 2998 and 3000, it represents a seated human figure. No. 2997 is of bird form, and 2999 closely resembles a turtle. No. 3137 is a very large, crudely carved object of animal form.

There are also four small figures of human shape, and a knife-handle of horn, boldly carved to represent certain ancestors of its Indian maker.

The rest of the collection includes stone dishes (some of cigar-holder shape), a stone labret, and a great number of stone chisels, hammers, arrow-points, etc.

Collection presented by Mrs. Dewdney on behalf of the late Edgar Dewdney (Nos. 2904 to 2911).

2904. Salish. Medicine-man's head-dress of two paws of grizzly bear with claws.

2905. Gambling set of four long polished bone, marked with diagonal and circular lines. Set of twelve sticks for counting. Kootenay.

2906. Salish. Spindle-whorl of big maple, carved to show two thunder-birds.

2907. Salish. Tension-ring of wood, a carved bird with ring below, used to cause tension while spinning. Lower Fraser.

2908. Salish. Two mat-creasers of maple, used when making rush mats. Lower Fraser.

2909. Salish. Halibut-hook of hemlock wood, U-shaped, bone barb, spruce-root wrapping lanyard of twisted gut. Lower Fraser.

2910. Salish. Stone chisel. Lower Fraser.

2911. Salish. Spoon of mountain-goat horn, the carved handle riveted to bowl; raven below holding inverted man.

Bella Coola Collection.

From Chief Schooner were purchased the following ceremonial objects:—

1. Nos. 2965 to 2973. Masks used at potlatches and dances and representing crests and legends of the chief's clan.

2965. Eagle mask (TsElkt).

2971. Loon Mask (Squsin). This crest was also observed in the graveyard.

2972. Setting-sun mask (Nothokomai). This is now the property of Schooner's son. It is shown at potlatches over a screen at the back of the dance-house, the wearer himself being out of sight.

2973. Eagle mask. This is one of the chief's principal family crests, and is shown at the same time as—

2969. Raven mask (Qoaxmanikwulla).

2966. Killer-whale mask (Suit). A large mask in three parts which represent the head (enq), the dorsal fins (qutleik), and the tail (sliamont). The story relating how this crest came into the chief's family is, in part, as follows:—

In far-distant days Schooner's ancestors lived in a large chief's house in the sky. The first of them of whom there is still any tradition was named Tamaltsen. This man when he danced used two masks, the eagle and the killer-whale. These were obtained by him at an old village named NuskElste, a place half-way up the River TEintz, which runs past Bella Coola. Of this place it is said that at one time the sea rose so high that it filled up all the streams and reached the tops of the mountains to the west of Bella Coola, driving out all the natives from their houses until they could climb no higher. Just in time to save them from extermination a huge killer-whale swam close up to their last place of refuge on the mountain-tops and most of the people were able to climb inside and so were saved. The whale was as large as a big house and here all were cared for until the waters subsided. When land was seen once more the raven flew up and down croaking joyfully that so many people had escaped from drowning.

2967, 2968. Small masks representing two of the people who were saved.

2. Nos. 2974 to 2976. Masks used in the cannibal winter dance. These are all bird masks with long narrow beaks differing slightly in certain details, and all are called Hauhau, the Bella Coola form of the Kwakiutl Hohok. These are only parts of a complete set belonging to the winter dance, but supplement specimens purchased at Bella Coola some years ago. It was then found impossible to obtain from any one owner a perfect series such as belong to several Kwakiutl chiefs. Chief Schooner's consent had to be obtained in every instance, and he also promptly annexed a large part of the purchase-money, without opposition from the seller. It was stated that outlying parts of the set used in the cannibal dance were held by different individuals belonging to the society and were liable to be called for.

Schooner said that his family came into possession of the cannibal dance in early days. One of his ancestors was walking along the beach near Bella Coola when suddenly there appeared rising out of the sea a large chief's house. Some people came to the door and invited him to go inside. Here he saw, sitting at the far end of the house, a chief whose name was Qomoqoya, who was wearing a ceremonial hat of great size. The visitor at once produced a valuable "copper" and presented it to Qomoqoya.

Two of the ancestor's brothers had been made prisoners and taken to this house, but soon after were drowned. For this reason the use of the cannibal masks was explained to him and the right to use them was granted.

PLATE I.

NOCTUIDÆ NEW TO BRITISH COLUMBIA.

Ufeus electra Sm.
Victoria, B.C. (Blackmore).

Sideridis rosea Harv.
Rossland, B.C. (Danby).

Polia nugatis Sm.
Lillooet, B.C. (Phair).

Lasionycta rainieri Sm.
Lillooet, B.C. (Phair).

Tholera americana Sm.
Lillooet, B.C. (Phair).

Euxoa ochrogaster race *insignata* Walk.
Victoria, B.C. (Blackmore).

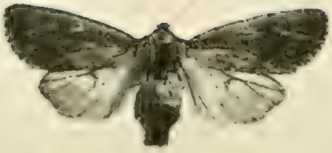
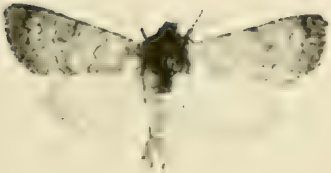
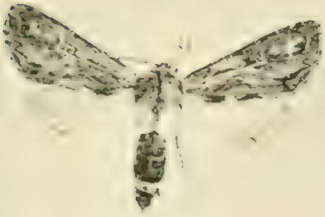
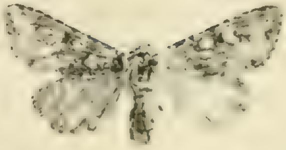
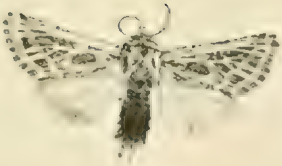
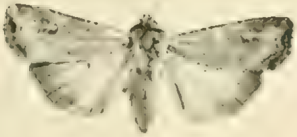
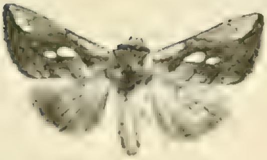
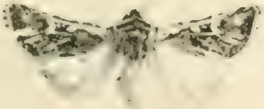
Autographa nichollæ Hamp.
Rosedale, B.C. (Blackmore).

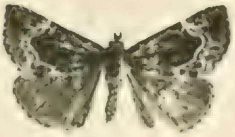
Euxoa cinereopallida Sm.
Lillooet, B.C. (Phair).

Chytolita morbidalis Gue.
Cloverdale, B.C. (Blackmore).

Bomolocha abalienalis Walk.
Rosedale, B.C. (Blackmore).

PLATE I



The house was named Nuskoahltnaixsta. Certain important chiefs in it were Smaiyakila, the head; SixsEkilaixla was a brother of the last; Atlkuntan and Nunatsonajen were also big chiefs and rulers. These were the spirits who presided over the cannibal dance.

2977. Storage-box (Pilkwa). This is a Bella Bella box.

2978. Spindle-whorl. Bella Coola.

BIRDS AND MAMMALS.

During the early part of the year a collection of bird-skins numbering 68 and mammal-skins numbering 154 were purchased from Mr. J. A. Munro, of Okanagan Landing; these skins are prepared in a most satisfactory manner, a number of them being collected in the Nicola District, from which the Department had very few specimens, thus making them very valuable in mapping out the distribution of species.

The Provincial Game Warden at Vancouver sent to the Museum two skins of wapiti, which had died while being transferred from the Colony Farm to be turned out in the Lillooet District. These animals were unfortunately badly skinned—in fact, ruined entirely for mounting purposes.

The raccoon group (*Procyon lotor*) in a wild crab-apple tree, which have been mounted for a great number of years and had become very much worn and faded, have been replaced by three good specimens, presented by Mr. J. N. Evans, Duncan, B.C.

The Museum was also fortunate in having a (albino) squirrel, "Vancouver Island Chickaree" (*Sciurus hudsonius vancouverensis*), presented by Mr. W. Fairall, which he shot on the Malahat, west side of Saanich Inlet, September 16th, 1917.

ENTOMOLOGY.

By E. H. Blackmore.

The weather conditions of the past season were very similar to those of the previous year, a very wet spring and early summer being followed by a dry hot spell which extended until late in September.

Throughout the valley of the Lower Fraser, the Coast District, and Vancouver Island the heavy rains of the early spring were continued on and off until the end of June. To those insects that in the pupal state pass the winter underground an abnormally heavy rainfall does a great deal of damage, causing many of the pupæ to rot, thereby reducing the number of individuals of those species. It also delays the appearance of many other species which, when they do emerge, are quickly killed off by the cold wet weather. On account of these conditions collecting in the early part of the season was exceedingly poor.

The late summer and early fall were very dry and warm, the sunny days being practically continuous for nearly three months. This continued hot weather brought out in greater numbers species which as a rule are rather scarce.

There was a rather severe outbreak of cutworms in the Victoria and Vancouver Districts during the month of May and the early part of June. A great deal of damage was done to small gardens and cultivated lots; in some instances whole beds of garden produce were completely devastated. The chief offenders were the dingy cutworm (*Feltia ducens* Walk.), the glassy cutworm (*Sideria devastator* Brace), and the caterpillars of *Euxoa messoria* Grote, *Euxoa excellens* Grote, and *Feltia vancouverensis* Grote. This latter species has not hitherto been considered of much economic importance, but I am convinced that it does as much damage as any of the others, with the possible exception of *Sideria devastator*.

During September a particularly bad infestation of shade and ornamental trees occurred in Victoria. This was caused by the larvæ of an undetermined species (*Tenthredo sp.*) of sawfly. In normal years they confine their ravages to the Lombardy poplar (*Populus dilatata* Ait.), which is their natural food-plant, but this year they occurred in such countless numbers that they attacked everything in sight, even invading houses and office buildings. The larvæ when full grown measure from 1¼ to 1½ inches in length and are of a brilliant yellow colour marked with round black spots on each segment. They are generally mistaken for the caterpillars of moths or butterflies, but they can always be distinguished by the fact that they have from six to eight pairs of prolegs; the false legs situated behind the three pairs of genuine legs near the front end of the body, while lepidopterous larvæ never have more than five pairs.

Lower Fraser Valley District.

At the request of the Director I made a three-weeks' collecting trip through this district, starting on June 11th and returning July 2nd. Taking into consideration the remarkable scarcity of insects in general up to the end of June, and also the number of wet days that occurred, the total amount of insects taken was very satisfactory; out of a total of nineteen days' actual collecting, there were six days of heavy rain, three days dull and cloudy, and ten days of bright sunshine.

On the rainy days, beating for Geometridæ and searching for Coleoptera was undertaken in the daytime, and at night collecting noctuids by "light" was successful. It was noticeable that more moths came to "light" on the wet nights than on those nights which had been preceded by a bright sunny day.

The localities visited were Vancouver, Cloverdale, and Rosedale. The Vancouver District was not at all productive, although trips were made to all the chief collecting-grounds, including Cauldfield (nine miles west of North Vancouver, on the P.G.E.), the famous Lynn Valley, Stanley Park, and South Vancouver, including the Eburne District.

Three days were spent at Cloverdale, twenty-five miles east of Vancouver, where some good material was taken, including some very interesting geometers taken while "dusking." The best district of all from a collecting point of view was certainly at Rosedale, where some valuable material was taken, some of it new to British Columbia.

Rosedale is situated at the apex of the valley, being about eighty miles from Vancouver, and is on the south side of the Fraser River (nearly opposite to Agassiz, at which place the fine Experimental Farm belonging to the Dominion Government is situated). It is heavily timbered on the north side, but skidways belonging to the shingle-mills in operation there furnished a convenient means of getting into the heart of the woods.

Mount Cheam, rising to a height of 6,925 feet, is situated about two miles away and is a magnificent sight when the rays of the setting sun strike its rugged peaks. An ascent of this mountain was contemplated, as some very desirable alpine species are known to occur there, but owing to the great depth of snow on the trails this was found to be impossible; in some places the snow was estimated as being from 30 to 40 feet in depth; three fresh falls of snow occurred during the nine days spent there. I found out from some of the inhabitants that the ascent to the top cannot be undertaken until the last week in July on account of the snow, and then it is only possible for about three or four weeks.

The total number of insects taken on the trip was 883, made up as follows: Lepidoptera, 589; Coleoptera, 72; Hymenoptera, 105; Diptera, 102; and Odonata, 15. The Lepidoptera were comprised of the following: Butterflies, 55; moths (other than geometers), 170; geometers, 272; and Microlepidoptera, 92.

The nomenclature used is that contained in Messrs. Barnes and McDunnough's Check-list of Lepidoptera of Boreal America, which has been adopted by the Museum, and which will be followed in all future Museum publications.

The scarcity of butterflies seen on the trip was very noticeable, a short series of *Pontia napi marginalis* Scud. being taken, while *Parnassius clodius claudianus* Stich. was captured at North Vancouver and at Rosedale. These were the only two species worthy of mention. Amongst the noctuids a nice series of both *Acronycta hesperida* Sm. and *A. oblinata* A. & S. were taken, most of them being newly emerged. Three specimens of that very desirable species *Autographa nichollæ* Hamp. were taken at "light" at Rosedale. Other species of interest were: *Polia lubens glaucopis* Hamp; *Luperina passer* Gue.; and *Hyppa xylinoides* Gue. In the subfamily *Hypeninæ* a number of specimens were taken, including a good series each of *Chytolita morbidalis* Gue. and *Hypena humuli* Harr. Three female specimens of *Bomolocha palparia* Walk. were captured at Rosedale; these are, to my knowledge, the first of this sex recorded for British Columbia, although I took a male specimen at Goldstream on June 16th, 1915; this was figured in the Report of the Provincial Museum, 1916, Plate VII.

A fine male specimen of *Bomolocha abalienalis* Walk. was taken at Rosedale on June 25th. This has never been recorded previously from British Columbia, and is an inhabitant of the Eastern and Middle States.

A nice collection of Geometridæ was made, including a single specimen of *Hydrelia albifera* Walk., at Rosedale on June 26th; this is the first authentic record of this species west of Kaslo.

Other desirable species taken at various localities in the valley were: *Cosymbia lumenaria* Hbn.; *Calocalpe undulata* Linn.; *Dysstroma occidentata mutata* Taylor; *Xanthorhœ designata emendata* Pears; *Euphyia multiferata* Walk.; *Epirrhœ alternata* Mull.; *Eupithecia casloata* Dyar; *E. castigata* Hub.; and *Metanema quercivoraria* Gue.

Amongst the micros two of particular interest are *Pyrausta ochosalis* Dyar, taken at Cloverdale (only previous record from Kaslo), and *P. funebris* Strom., captured at Rosedale.

The Coleoptera and Hymenoptera have not been worked over as yet, but some work has been done on the Diptera, many of which, however, await further determination.

Odonata (Dragon-flies).

A small collection of about forty specimens were recently submitted to Dr. E. M. Walker, of Toronto, for identification. They comprised seventeen species, three of which, it is pleasing to note, are species that have not previously been recorded from British Columbia, viz.:—

Cœnagrion resolutum Hagen. One female taken by W. A. Newcombe at Chilcotin on June 25th, 1915.

Leucorrhinia intacta Hagen. Two males taken by J. A. Munro at Okanagan Landing on July 6th, 1916, and one male taken by W. R. Carter at Alberni on July 29th, 1915.

Leucorrhinia borealis Hagen. One male taken by W. A. Newcombe at Chilcotin on June 22nd, 1915.

Hereunder we publish a list of the remaining fourteen species, with their localities, and hope at some future date to give a complete list of the Odonata of British Columbia, an order which has hitherto been somewhat neglected:—

Enallagma calverti Morse. Vancouver (E. H. Blackmore).
Enallagma cyathigerum Charp. Chilcotin (W. A. Newcombe); Cranbrook (C. Garrett).
Enallagma carunculatum Morse. Alberni (W. R. Carter).
Æshna interrupta nevadensis Walker. Quesnel Forks (Newcombe).
Tetragoneuria spinigera Selys. Alberni (Carter).
Cordulia shurtleffi Scudd. Vancouver (Blackmore); Cranbrook (Garrett).
Libellua quadrimaculata Linn. Cranbrook (Garrett).
Libellua lydia Drury. Cloverdale (Blackmore); Rosedale (Blackmore).
Sympetrum scoticum Donovan. Quesnel Forks (Newcombe).
Sympetrum costiferum Hagen. Okanagan Landing (Munro).
Sympetrum decisum Hagen. Okanagan Landing (Munro).
Sympetrum obtrusum Hagen. Okanagan Landing (Munro).
Leucorrhinia glacialis Hagen. Okanagan Landing (Munro).
Leucorrhinia hudsonica Selys. Vancouver (Blackmore); Cranbrook (Garrett).

Rare and Uncommon Insects taken in British Columbia during 1917.

Under this heading we propose to give a list of the rare and uncommon insects which have been taken during the past season at various localities in the Province of which we have any knowledge. Properly authenticated records of these insects from any collection in the Province will be gladly welcomed. It is hoped by this means to get a better knowledge of the distribution and geographical range of our lesser-known species, which in some instances may eventually prove of great economic value.

Victoria.—During the past season the writer, with the assistance of Mr. Edward Cooke and Mr. Arthur Robinson, of this city, has been fortunate in taking many desirable species of noctuids and geometrids.

From a pupa found in the city park I bred a splendid female specimen of *Smerinthus cerisyi opthalmicus* form *pallidulus* Edw. This is a very rare form and is new to British Columbia. The ground colour is of a beautiful pale fawn, in contradistinction to the dark olive-brown colour of typical *opthalmicus*. Amongst the noctuids taken were the following uncommon species: *Euxoa intrita reuda* Streck; *E. terrena* Sm. (very rare); *E. divergens* Walk.; *E. atrifera* (rare); *Matuta apposita* Grt.; *Eriopyga infidelis* Dyar; *Eurotype contadina* Sm.; *Eumichtis loda* Streck; *Septis antennata purpurissata* B. & McD. (rare); *Trachea cinefacta* Grt.; *Ufeus electra*, Sm.; *Luperina passer* Gue. (rare); and *Autographa ampla* Walk. This latter is the first record from Victoria that I know of, although it has previously been taken at Duncan and Wellington.

Several interesting specimens were taken amongst the Geometridæ, including two new to the Province—viz., *Venusia duodecemlineata* Pack. and *Eupithecia borealis* Hlst. The former was taken at rest on an electric-light pole by the writer in April. It is closely allied to *V. pearsalli* Dyar (which is one of our commonest spring species), but can be distinguished by its generally darker colour and the wavy extra-discal line on the forewings. The latter was taken at "light" by Mr. A. Robinson on June 27th, and another specimen was taken by Mr. W. Downes at Oak Bay on the 30th of the same month. This species was originally described from Manitoba.

The other geometers of more than passing interest were: *Lobophora nivigerata* Walk.; this has been an exceedingly rare species until this year, when we had the good fortune to take half a dozen specimens; *Cosymbria dataria* Hlst.; *Calocalpe undulata* Linn.; *Nematocampa limbata* Haw. As recorded in last year's Annual Report, this pretty little geometer had not been recorded from this district for twelve years until 1916, when two specimens were captured at "light." This season a special look-out was kept, with the result that a nice series of eleven specimens were taken. It is evidently very local. *Metanema inatomaria* Gue.; a single specimen was taken at "light" in the same locality as the one taken last year. *Pero occidentalis* Hulst.; two males were taken on June 4th and 7th respectively. This is a very interesting record, as it is rather a rare species and not previously known west of Penticton.

We have specimens from the latter locality and also from Rossland. The *Azelina occidentalis* Hulst., given as "generally distributed" in the 1906 Check-list of British Columbia Lepidoptera, is an error, as the species there referred to is *Pero giganteus* Grossb., which has a known range from Vancouver Island to Kaslo. The chief determining character of *occidentalis* is the dentate antennæ of the male; in the other three species of *Pero* which occur in British Columbia the antennæ are filiform in both sexes.

Mr. W. B. Anderson, Inspector of Indian Orchards, took a single specimen of *Neptyia phantasmaria* Streck in September. This is also an interesting record, as this, together with one taken by the writer in September, 1915, constitutes the only known records of this species in Victoria.

The same collector also took a specimen of *Hæmorrhagia diffinis rubens* Hy. Edw. in his garden at Oak Bay in September. This species is single-brooded and flies about the first week in May; the most probable explanation is that the cocoon, which is generally spun up under fallen leaves, was lying in an exposed place subject to the direct rays of the sun, and consequently brought to maturity at the end of the summer instead of lying dormant until the following May.

The following noctuids, collected by Mr. W. Downes, of Oak Bay, are worthy of mention: *Euxoa catenula* Grt. (new to this district); *E. esta* Sm. (rare); *Polia lubens glaucopis* Hamp.; *Septis multicolor* Dyar (rather rare); *Trachea finitima cerivana* Sm.; and *Autographa celsa* Hy. Edw. He also took a short series of *Eupithecia obumbrata* Taylor on Mount Tolmie in May. This is the first record of this species in Victoria. It is evidently a mountain form, as it has been taken by Mr. Day on Mount Tzouhalem, near Duncan, and also on the mountains at Goldstream.

I nearly forgot to mention that a school-boy captured a specimen of *Pseudohazis eglanterina* Bdv. (the sheep-moth) near the Ross Bay Cemetery. This is the first record of this species that we have from Victoria; it occurs sparingly at Goldstream, Shawnigan, and Duncan.

Goldstream.—On one of the writer's occasional trips to this locality a number of noctuid moths were taken after dark feeding on a large patch of cultivated sunflowers, amongst which were specimens of *Euxoa esta* (rare); *E. tessellata tesselloides* Grt.; and *Rhynchagrotis rufipectus* Morr. On another occasion a beautiful specimen in perfect condition of *Cleora excelsaria* Streck was taken. This is the first capture of this exceedingly rare geometer that has been recorded for about thirteen years. It was taken at rest on a fire-blackened tree-trunk early on the morning of June 4th. An extensive search for further specimens was made, but no others were seen.

A nice series of *Perizoma costiguttata* Hulst. was obtained on the 3rd and 4th of the same month; this species is evidently very local in its habits.

Duncan.—Mr. G. O. Day, of Quamichan Lake, has succeeded in breeding a short series of that uncommon deltoid *Bomolocha toreuta* Grt. The larvæ were found feeding on dogwood in

August of 1916, and the adults emerged at the end of the following May. This is a valuable record, as the knowledge of the food-plants of a great many of our species is very limited.

It is also interesting to note that Mr. Day also took a fine specimen of *Venusia obsoleta* Swett on April 18th. This species was described last year from specimens found in the Harvey and the Museum collections taken in 1908, and was figured in the Provincial Museum Report for 1916 on Plate VIII.

Mr. A. W. Hanham, also of Quamichan Lake, took a beautiful geometer on June 20th, which turned out to be *Stamnoctenis morrisata* Hulst., a species which was described from Arizona and is entirely new to our fauna.

Cumberland.—A few specimens of *Cercyonsis alope ariane* Bdv. were taken in this district in July. This is noteworthy as no species of this genus has ever been recorded from Vancouver Island before. *Boopis* Behr., a form of *ariane* with fewer spots on the under-side, occurs in the Interior from Lillooet to Cranbrook.

Savary Island.—Mr. R. S. Sherman, of Vancouver, who spends his annual vacation on this island, reports that he has seen specimens of *Danaus archippus* Fabr. (the milkweed butterfly) there every year for several years, and that this year he found several patches of milkweed growing there. As this is the natural food-plant of *archippus*, the probabilities are that it breeds on this island, but this fact will have to be proved before it can be accepted as such. This butterfly has a cosmopolitan range, but has not been known to breed in British Columbia, although occasional specimens have been taken in various parts of the Province. He also mentions that *Epargyreus tityrus* Fabr. (the large silver-spotted skipper) was very common in July. It has been previously recorded from Vancouver and doubtfully from Glacier.

Cloverdale.—Mr. Bevan L. Hugh, who collected a number of geometers during the past season, captured a specimen of *Philobia ulsterata* Pearson. This is an exceedingly rare geometer, and is the first taken to my knowledge since 1908, when the late Mr. A. H. Bush took one in Vancouver. Amongst others taken by the same collector was a nice series of *Sparganía magnoliata pernotata* Hulst. and a fine specimen of *Selenia alciphearia ornata* B. & McD.

Quesnel Forks.—While engaged on business connected with the Provincial Fisheries Department in this district in late August and September, Mr. W. A. Newcombe, of Victoria, collected a few insects which proved of great interest, as we had not received any material from this particular district previously. The butterflies taken were *Phyciodes campestris* Behr.; *Polygonia progne* Cram.; and *Aglais J.-album* Bdv. & LeCon.

A short series of *Hypoprepia miniata* Kby. (the scarlet-winged lichen-moth), was obtained; this has previously been recorded from Kaslo. The Noctuidæ comprised *Euxoa mimallonis gagates* Grt.; *Graptolitha georgii* Grt.; *Catocala briseis* Edw. (previously recorded from Kaslo); *Autographa rectangula* Kirby; and *Scoliopteryx libatrix* Linn. The geometers proved scarce, only three species being taken, viz.: *Lygris xylina* Hulst.; *Hydriomena furcata* Thun; and *Ceratodalia gueneata* Pack.

Lillooet.—In the beginning of August Mr. A. W. A. Phair took two or three specimens of a bright coppery-red butterfly which we identified as *Heodes cupreus* Edw. It was taken at Mount McLean at an altitude of 7,000 feet, and is a new record for British Columbia. It is very closely allied to *H. snowi* Edw., which also occurs in British Columbia, but is very rarely taken; *cupreus* is brighter in colour and more heavily spotted than *snowi*. He has kindly donated a pair for the Museum collection.

Mr. Phair, on a recent visit to Victoria, brought with him a large amount of material for identification; as many of the noctuids were new to us, we sent them to Dr. J. McDunnough for determination, with the result that many of them proved new to British Columbia, and materially add to the known lepidopterous fauna of this Province.

The following is a list of those new to British Columbia: *Euxoa cinereopallida* Sm.; *Agrotis piscipellis* Grt.; *Rynchagrotis vittifrons* Grt.; *Lasionycta rainieri* Sm.; *Polia nugatis* Sm.; *Polia farnhami* Grt.; *Tholera americana* Sm.; and *Cerapoda oblita* Grt. Amongst the others were some very desirable species, the following being of special interest as extending our knowledge of their known range; *Euxoa satiens* Sm.; *E. murdocki* Sm.; *Lasiestra phoca luteola* Sm.; and *Pseudanarta flava* Grt.

NEW BRITISH COLUMBIA LEPIDOPTERA.

Under this heading we publish an annotated list of those new species and varieties which have been described during the past season. We believe that this list will be of value to those entomologists in the Province who are unable to keep in touch with all the current literature on the subject, but who are desirous of keeping their collections and check-lists up to date in nomenclature and scientific arrangement.

Glaucopsyche lygdamus columbia Skin. This new race of *lygdamus* was described by Dr. Henry Skinner in the Ent. News for May, 1917. The type and paratypes are from Port Columbia, Wash. Amongst other localities mentioned for this species is Corfield, Vancouver. We presume this is meant for Corfield, near Duncan, on Vancouver Island. This pretty blue butterfly is fairly common all over the Island about May, and has been going under the name of *G. lygdamus behrii* Edw. (*vide* Report, Provincial Museum, 1916). The true *behrii* is a California race of *lygdamus*, with San Francisco as its probable nimotypical locality; *columbia* differs from *behrii* in being of a much deeper shade of blue and the spots on the under-side of the wings being larger.

In Vol. III., No. 4, Cont. Lept. No. Amer., March, 1917, Messrs. Barnes and McDunnough describe a number of new species and varieties of Geometridæ, amongst which are eight new to British Columbia. As these "Contributions" were published subsequent to the issuance of their new check-list, the following additions must be made to it:—

Trichodesia albovittata tenuifasciata B. & McD. This form was described from Spirit Lake, Idaho. In the Barnes collection there were specimens from Wellington, B.C., and the writer has a specimen taken by Mr. W. H. Danby at Ymir in 1900. In this variety the white band of primaries is much narrower, being only 1 mm. in width.

Thera georgii benesignata B. & McD. This racial name has been given to the Vancouver Island form on account of its larger size, paler colour, and the strong contrast between the brown median and basal areas and the ground colour. Typical *georgii* is now restricted to the Nevada species. The types of *benesignata* are from Wellington and the paratypes from Duncan.

Mesoleuca gratulata latialbata B. & McD. Described from three specimens from Plumas County, Cal. In this form the median white band is strongly constricted centrally below the cell, due to an outward bulge in the dark basal area and a strong inward bend below vein 4 of the outer dark area. I have a specimen from Kaslo which Dr. McDunnough considers this form, although the basal line is not quite typical.

Epirrhœ plebeculata vivida B. & McD. This is the species hitherto known as *Rheumaptera rubrosuffusata* Pack., which occurs commonly throughout the Island and Lower Mainland. *Rubrosuffusata* has been found to be a synonym of *plebeculata*, which was described by Guenee, from California, and the racial name of *vivida* is proposed for our Vancouver Island form on account of the coloration being much better defined.

In describing a new species, *Phasiane ponderosa*, Messrs. Barnes and McDunnough mention a variety of it under the form name of *demaculata*, in which the cross-lines tend to become obsolescent, especially in the females. The types are from Calgary, Alta., but one of the female paratypes is from Field, B.C. We have two rather worn females, one from Atlin, taken by E. M. Anderson, and one from Chilcotin, taken by W. A. Newcombe, so that although uncommon it is widely distributed.

Itame plumosata B. & McD. This pretty yellow and brown geometer was described from specimens taken in various localities in Arizona and Utah. We have a male specimen from Mount McLean near Lillooet, taken in July, 1916, by E. M. Anderson. It is rather remarkable that this species should turn up here, as it is a long way from its nimotypical locality; it is apparently a high altitude species and may turn up on any of the high mountains in the intervening country.

Cleora satisfacta B. & McD. Described from one male and one female taken at Kaslo. This is closer in general habitus to *excelsaria* Streck and *albescens* Hulst. than to any other *Cleora* that occurs in the Province.

Æthaloptera anticaria fumata B. & McD. This is the insect from Kaslo that has been previously known as *Æ. intextata* Walk. Dr. McDunnough states that *anticaria* should be used for the common Eastern species instead of *intextata*, and proposes the name of *fumata* for the

PLATE II.

GEOMETRIDÆ.

Cleora excelsaria Streck.
Goldstream, B.C. (Blackmore).
(Very rare.)

Stamnoctenis morrisata Hulst.
Duncan, B.C. (Hanham).
(New to British Columbia.)

Xanthorhœ blackmorei Swett.
(Paratype male.)
Victoria, B.C. (Blackmore).
(New to science.)

Xanthorhœ blackmorei Swett.
(Paratype female.)
Victoria, B.C. (Blackmore).
(New to science.)

Xanthorhœ macdunnoughi Swett.
(Allotype female.)
Victoria, B.C. (Blackmore).
(New to science.)

Xanthorhœ atlinensis Swett.
(Paratype male.)
Atlin, B.C. (Anderson).
(New to science.)

Philobia ulsterata Pears.
Cloverdale, B.C. (Bevan Hugh).
(Very rare.)

Lygris destinata race *schistacea* Warr.
Kaslo, B.C. (Cockle).
(New to British Columbia.)

Itame plumosata B. & McD.
Armstrong, B.C. (Downes).
(New to British Columbia.)

Drepanulatrix carnearia Hulst.
Rossland, B.C. (Danby).
(New to British Columbia.)

PLATE II

Kaslo race, which is more evenly suffused with smoky brown and with the lines more or less obsolescent. The types are six males from Kaslo, presumably taken by Mr. J. W. Cockle. This locality is the only one from which we have any record of this species.

In addition to the foregoing, it is as well to note that Messrs. Barnes and McDunnough have given the study of *Sicya macularia* Harris and its various races considerable attention, with the result that *crocearia* Pack. is rescued from the synonymy and applied to the form that occurs in the Great Basin Region of the United States, and also to a similar form occurring on Vancouver Island. For the benefit of those collectors who may think that they have two different varieties of this species, it is as well to add that this form is sexually dimorphic. In a long series taken by the writer it is noticeable that while the females in general are much scarcer than the males, the dimorphic female is far more prevalent than the typical one.

In Cont. Lep. No. Amer., Vol. IV., No. 1, May, 1917, Messrs. Barnes and McDunnough have revised the whole of the genus *Hydriomena*. Many radical changes have been made and new species added, some of which refer to our British Columbia forms, so that it will be advisable for collectors to alter their check-lists accordingly.

Hydriomena albifasciata victoria B. & McD. This has always been listed as *reflata* Grt. in British Columbia collections, but this name has been restricted to an Arizona race of *albifasciata*, and the name *victoria* has been given to the Vancouver Island form; the types being three males and two females from Victoria.

Hydriomena exculpata tribulata B. & McD. This is a grey form of *exculpata*, a new species described from Ketchikan, Alaska. The localities given for the form *tribulata* are Oregon, Colorado, and Kaslo, B.C.

Hydriomena perfracta exasperata B. & McD. The race *exasperata* was described from two specimens taken by the late Rev. G. W. Taylor, one at Departure Bay, near Nanaimo, and the other at Wellington. It is evidently very rare. One male specimen was taken by the writer at Victoria on May 19th, 1914.

Hydriomena renunciata columbiata form *pernigrata* B. & McD. The types of this form came from Glacier National Park, Montana; the paratypes, one male and one female, from Skagit Basin, B.C.; and one male from Stikine River, B.C. The latter probably collected by Theodore Bryant, of Ladysmith, who collected in that district when with a survey party.

Hydriomena edenata grandis B. & McD. The racial name of *grandis* has been given to our Vancouver Island form, which has been previously known as *edenata* Swett. Typical *edenata*, which was described from Eden Valley, Monterey County, Cal., is very much smaller than the one we get here and is shaded with a warm brown, while our form is tinged with green.

The genus *Xanthorhœ*, which contains several distinct groups of species, has been badly mixed up in the past, and much misidentification of species has ensued.

As it was also felt that there were several species, or at least good varieties, going under the same name, the writer collected extensively in this genus for several years, with the result that Mr. L. W. Swett, the well-known geometridist, described several new forms of the *defensaria* group, which were illustrated in the Annual Report of the Provincial Museum for the year 1915, Plate VII., Figs. 5 to 12.

In the *pontiaria-fossaria* group Mr. Swett has just described the following three new species in the Can. Ent., Vol. 50, No. 1, p. 17 *et seq.*:—

Xanthorhœ macdunnoughi Swett. This occurs all over the southern portion of Vancouver Island, but it is not common by any means. The types are from specimens taken by the writer at Victoria. Paratypes of each sex have been placed in the Museum collection.

Xanthorhœ atlinensis Swett. This species was taken at Atlin by E. M. Anderson in 1914, and was described from eight specimens, all male. It is close to *fossaria* Taylor, which was described from Mount Cheam. Paratypes are in the Museum collection.

Xanthorhœ blackmorei Swett. Described from material taken by the writer at Goldstream and Victoria. This species is very distinct, as in most cases the blackish median band becomes obsolescent below the median vein. A male paratype has been placed in the Museum collection. Illustrations of these new species will be found in an accompanying plate.

BOTANY.

During the season of 1917 there have been numerous accessions to the Herbarium of the Provincial Museum, notably the presentation of a large collection of plants of Vancouver Island.

collected, mounted, and named by Professor John Macoun since he has resided at Sidney, B.C., together with a collection of Musci and Lichens made by him on Vancouver Island and a portion of the Mainland of this Province. This collection, made and named by so eminent a botanist, will be a valuable acquisition as a source of reference in the identity and for determination of other specimens.

Mr. W. B. Anderson, of Victoria, has contributed a large number of plants, collected in his leisure hours, from the Interior, which cover many localities, from Fort George to Penticton and extending through West Kootenay. This collection will undoubtedly add much new material to the Herbarium, especially as regards distribution.

The Fort George specimens cover a new area not hitherto represented in the collection. A few of the plants from the various localities mentioned are as follows:—

Chenopodium botrys.
Axyris amarantoides.
Calochortus elegans.
Melampyrum lineare.
Anemone virginiana.
Chrysothamnus nauseosus.
Chimaphila menziesii.
Antennaria rosea.
Anthriscus sativa.
Gilia aggregata.
Physostegia parviflora.
Orthocarpus luteus.
Potentilla flabelliformis.
Galeopsis tetrahit.
Crepis tectorum.
Echium vulgare.
Hieracium scouleri var. *cynoglossoides.*
Erigeron acris var. *drœbachiensis.*
Senecio balsamitæ var. *thomsoniensis.*

Among these *Axyris amarantoides* L. and *Crepis tectorum* L., introduced plants, appear to be additions to the flora of British Columbia.

Mr. W. A. Newcombe has also donated a representative collection made in the vicinity of Quesnel Lake and a portion of the Chilcotin country during the seasons of 1916 and 1917; amongst the rarer species and some not previously reported from these regions are the following:—

CHILCOTIN, 1916.

Stephanomeria minor.
Calochortus macrocarpus.
Solidago decumbens.
Mentzalia lævicaulis.

QUESNEL LAKE, 1917.

Epipactis repens var. *ophioides.*
Habenaria orbiculata.
Parnassia palustris.
Rubus strigosus.
Spiræa menziesii.
Dracocephalum parviflorum.
Stephanomeria minor.
Alnus tenuifolia.
Mitella nuda.
Ribes glandulosum.
Ribes oxyacanthoides.
Vaccinium canadense.
Hieracium umbellatum.
Senecio eremophilus.

In this as in Mr. Anderson's collection there are a number of doubtful specimens, which have been forwarded to Mr. J. M. Macoun, Chief of the Division of Biology, Geological Survey, Ottawa, and Professor J. K. Henry, of the University of British Columbia, for comparison with authenticated specimens and identification, and until such time as this work has been completed no adequate list can be chronicled.

Specimens of two additions to the flora of Vancouver Island, *Arnica cordifolia* and *Romanzoffia unalaschensis*, collected by Dr. C. F. Newcombe, of Victoria, have been donated by him to the collection in the Herbarium.

On June 16th, 17th, and 18th, Mr. F. Kermode, Director, accompanied by Dr. F. C. Newcombe, of Victoria, made a small collection of the more uncommon plants growing around Bella Coola; the following, which are usually plants growing at much higher altitude, were collected on the river-bottom, a little above sea-level:—

Epilobium latifolium.
Mimulus lewisii.
Pentstemon diffusus.

In the matter of distribution the following interesting species were collected in close proximity to salt water:—

Trautvetteria grandis.
Ranunculus orthorynchus var. *platyphyllus.*
Hemieva ranunculifolia.
Corydalis sempervirens.
Aralia nudicaulis.
Senecio balsamitæ var. *thomsoniensis.*

The Director and his assistant made a small collection on August 1st and 2nd of the more interesting plants of Mount Arrowsmith, undoubtedly one of the richest floral fields of Vancouver Island. The following specimens were collected, which appear to be additions to the flora of Vancouver Island not hitherto recorded:—

Oxyria digyna.
Lewisia pygmæa.
Saxifraga lyallii.
Antennaria rosea.
Draba nivalis.
Silene acaulis.
Osmorrhiza purpurea.
Agoseris glauca.

Other species of interest were:—

Lewisia columbiana.
Erysimum elatum.
Saxifraga punctata.
Potentilla dissecta var. *glaucophylla.*
Lomatium martindalei var. *augustatum.*
Cladothamnus pyrolæflorus.
Mimulus alpinus.
Pedicularis ornithoryncha.
Arnica amplexicaulis.
Ranunculus eschscholtzii.
Saxifraga bronchialis.
Saxifraga tolmici.
Potentilla villosa.
Epilobium anagallidifolium.
Dodecatheon pauciflorum.
Phyllodoce glanduliflorus.
Arnica latifolia.
Senecio triangularis.

A few plants were also collected in the vicinity of Long Beach, on the west coast of Vancouver Island, the latter part of September, including:—

Polypodium scouleri.
Carex macrocephala.
Listera caurina.
Gentiana douglasiana.
Stachys ciliata var. *pubens.*
Botrychium silaifolium.
Hydastylus brachypus.
Empetrum nigrum.
Franseria bipinnatifida.

A large number of specimens have been mounted by Miss H. J. Hendry, now in charge of the office of the Museum, and placed in the collection of the Herbarium; a card-index has been completed of the mounted specimens, and the whole have been arranged in their systematic order of families, according to the check-list of the plants of Gray's Manual.

A record has also been made of all duplicates and unmounted material, and the same placed in genus-covers and arranged in the same systematic order.

The nucleus of the Herbarium, the original collection loaned by the Department of Agriculture, and made by Mr. J. R. Anderson at the time he was Deputy Minister of Agriculture, has been rearranged and placed in the accepted order; this collection still remains in its original genus-covers and is in an excellent state of preservation, due to the great care Mr. Anderson took in preparing his specimens, many of which were collected twenty years ago.

From an educational standpoint the collection now in the Herbarium is available to teachers and other students of botany, and should prove a great facility to them for comparison in identifying any plants they do not know. A number of the latest and most authentic books on our flora are also at hand for reference; these will be found in the office of the Museum.

LIST OF VANCOUVER ISLAND PLANTS COLLECTED AND PRESENTED TO THE PROVINCIAL MUSEUM.

By Professor John Macoun, of Sidney, B.C.

Polypodiaceæ.

Adiantum pedatum L.
Aspidium spinulosum (O. F. Müller) Sw., var. *dilatatum* (Hoffm.) Hook.
Asplenium felix-fœmina (L.) Bernh.
Cystopteris fragilis (L.) Bernh.
Cryptogramma acrostichoides R. Br.
Lomaria spicant Desv.
Polypodium occidentale (Hook.) Maxon.
Polystichum braunii (Spenner) Fée, var. *andersoni.*
Polystichum munitum (Kaulf.) Presl.
Pteris aquilina lanuginosa Bong.
Woodwardia radicans (Smith), var. *americana* Hook.

Ophioglossaceæ.

Botrychium simplex Hitchc.
Botrychium silaifolium Presl.
Botrychium virginianum (L.) Sw.

EQUISETACEÆ.

Equisetum arvense L.
Equisetum sylvaticum L.
Equisetum telmateia Ehrh.

LYCOPODIACEÆ.

Lycopodium clavatum L.
Lycopodium lucidulum Michx.

SELAGINELLACEÆ.

Selaginella wallacei Hieron.

ISŒTACEÆ.

Isoetes echinospora Durieu.

TAXACEÆ.

Taxus brevifolia Nutt.

PINACEÆ.

Abies grandis Lindl.
Chamæcyparis nootkatensis (Lamb.) Spach.
Juniperus scopulorum Sarg.
Picea sitchensis Carr.
Pinus contorta Dougl.
Pinus monticola Dougl.
Pseudotsuga taxifolia Britt.
Thuja plicata Donn.
Tsuga heterophylla (Raf.) Sarg.

TYPHACEÆ.

Typha latifolia L.

SPARGANIACEÆ.

Sparganium americanum Nutt., var. *androcladum* Engelm.
Sparganium simplex Huds.

GRAMINACEÆ.

Agropyron pseudorepens var. *magnum* Scribn. & Smith.
Agrostis alba L.
Agrostis alba L., var. *stolonifera*.
Agrostis exarata Trin.
Agrostis hyemalis (Walt.) Tuckerm.
Agrostis microphylla Steud.
Agrostis vulgaris (With.) Thurb.
Aira caryophyllea L.
Aira precox L.
Alopecurus californicus Vasey.
Alopecurus geniculatus L., var. *fulvus* (Smith) Sonder.
Alopecurus pratensis L.
Anthoxanthum odoratum L.
Arrhenatherum avenaceum Boiss.
Avena fatua L., var. *glabrata* Peter.
Bromus carinatus hookerianus (Thurb.) Shear.
Bromus commutatus Schrad.
Bromus glabrescens (Coss.) Shear.
Bromus hordeaceus L.
Bromus marginatus Nees.
Bromus maximus Desf.
Bromus pacificus Shear.
Bromus secalinus L.
Bromus sitchensis Bong.
Bromus sterilis L.
Bromus tectorum L.
Bromus vulgaris Shear.
Cinna latifolia (Trev.) Griseb.
Cynosurus cristatus L.
Cynosurus echinatus L.
Dactylis glomerata L.
Danthonia americana Scribn.
Danthonia spicata (L.) Beauv.
Deschampsia cæspitosa (L.) Beauv.
Deschampsia calycina Presl.
Deschampsia elongata (Hook.) Munro.
Elymus arenarius L.
Elymus borealis Scribn.
Elymus glaucus Buckl.
Elymus glaucus Buckl., var. *hirsutus* Malte.
Elymus vancouverensis Vasey.
Festuca bromoides L.
Festuca elatior L.
Festuca megalura Nutt.
Festuca occidentalis Hook.
Festuca pacifica Piper.
Festuca rubra L.
Festuca subuliflora Scribn.
Festuca subulata Trin.
Glyceria borealis (Nash) Batchelder.
Glyceria nervata Trin.
Glyceria nervata Trin., var. *elata* (Nash) Piper.
Glyceria pauciflora Presl.
Glyceria scabra Malte., *sp. nov.*
Holcus lanatus L.
Hordeum nodosum L.
Hordeum murinum L.
Kœleria cristata (L.) Pers.
Lolium multiflorum Lam.
Lolium perenne L.

Phalaris arundinacea L.
Phalaris canariensis L.
Phleum pratense L.
Phragmites communis Trin.
Poa annua L.
Poa compressa L.
Poa confinis Vasey.
Poa howellii Vasey.
Poa pratensis L.
Poa sandbergii Vasey.
Poa triflora Gilib.
Poa trivialis L.
Polypogon monspeliensis (L.) Desf.
Polypogon littoralis (With.) Smith.
Puccinellia lemmoni Vasey.
Puccinellia distans (L.) Parl.
Stipa minor (Vasey) Scribn.
Stipa nov. sp. Malte.

CYPERACEÆ.

Carex arcta Boott.
Carex athrostachya Olney.
Carex aurea Nutt.
Carex bolanderi Olney.
Carex canescens L.
Carex cryptocarpa C. A. Mey.
Carex deweyana Schwein.
Carex diandra Schrank, var. *ampla* Bailey.
Carex dives Holm.
Carex festiva Dew.
Carex festiva pachystachya (Cham.) Bailey.
Carex furva (Bailey).
Carex hendersoni Bailey.
Carex howellii Bailey.
Carex læviculmis Meinsch.
Carex leptalea Wahl.
Carex mirata Dew.
Carex œderi Retz.
Carex pennsylvanica Lam., var. *vespertina* Bailey.
Carex phæocephala Piper.
Carex pratensis Drejer.
Carex rossii Boott.
Carex stellulata Good, var. *cephalantha* Bailey.
Carex stipata Muhl.
Carex teretiuscula ramosa Boott.
Carex utriculata Boott.
Carex vulgaris lipocarpha Holm.
Dulichium arundinaceum (L.) Britt.
Eleocharis palustris (L.) R. & S.
Scirpus americanus Pers.
Scirpus microcarpus Presl.
Scirpus occidentalis (Wats.) Chase.
Scirpus riparius (R. Br.) Spreng.
Scirpus robustus Pursh.
Scirpus validus Vahl.

ARACEÆ.

Lysichiton camtschatcensis (L.) Schott.

LEMNACEÆ.

Lemna trisulca L.
Spirodela polyrhiza (L.) Schleid.

JUNCACEÆ.

Juncus balticus Willd.
Juncus bufonius L.
Juncus columbianus Coville.
Juncus effusus L., var. *brunneus* Engelm.
Juncus effusus gracilis Hook.
Juncus effusus L., var. *pacificus* F. & W.
Juncus ensifolius Wiks.
Juncus falcatus E. Meyer.
Juncus falcatus var. *alaskensis* Coville.
Juncus gerardi Loisel.
Juncus lescurii Boland.
Juncus occidentalis (Coville) Wiegand.
Juncus tenuis Willd.
Luzula campestris (L.) DC.
Luzula campestris (L.) DC., var. *subsessilis* Wats.
Luzula comosa E. Meyer.
Luzula comosa E. Meyer, var. *macrantha* Wats.
Luzula parviflora (Ehrh.) Desv.
Luzula spicata (L.) DC.

LILIACEÆ.

Allium acuminatum Hook.
Allium cernuum Roth.
Allium geyeri Wats.
Camassia leichtlinii (Baker) Coville.
Camassia quamash (Pursh) Coville.
Disporum oreganum (Wats.) B. & H.
Erythronium giganteum Lindl.
Fritillaria lanceolata Pursh.
Hookera hyacinthina (Lindl.) Kuntz.
Lilium parviflorum (Hook.) Holzinger.
Maianthemum bifolium dilitatum Wood.
Smilacina amplexicaulis Nutt.
Smilacina sessilifolia Nutt.
Stenanthium occidentale Gray.

Streptopus amplexifolius (L.) DC.
Tofieldia intermedia Rydb.
Trillium ovatum Pursh.
Veratrum viride Ait.
Zygadenus venenosus Wats.

IRIDACEÆ.

Hydastylus borealis Bicknell.
Olsynium grandiflorum (Dougl.) Raf.
Sisyrinchium birameum Piper.
Sisyrinchium idahoënse Bicknell.
Sisyrinchium macounii Bicknell.

ORCHIDACEÆ.

Calypso bulbosa (L.) Oakes.
Corallorrhiza maculata Raf.
Corallorrhiza mertensiana Bong.
Corallorrhiza stricta Lindl.
Habenaria dilitata Hook.
Habenaria elegans Boland.
Habenaria gracilis Wats.
Habenaria leucostachys (Lindl.) Wats.
Habenaria unalaschensis (Spreng.) Wats.
Listera caurina Piper.
Listera convallarioides (Sw.) Torr.
Peramium decipiens (Hook.) Ames.
Spiranthes romanzoffiana Cham.

SALICACEÆ.

Populus tremuloides Michx.
Populus trichocarpa T. & G.
Populus vancouveriana Trelease.
Salix geyeriana Anderss.
Salix geyeriana Anderss, X *sitchensis.*
Salix hookeriana Barratt.
Salix lasiandra Benth.
Salix sitchensis Sanson.
Salix scouleriana Barratt.

MYRICACEÆ.

Myrica gale L.

BETULACEÆ.

Betula occidentalis Hook.
Alnus oregona Nut.

FAGACEÆ.

Quercus garryana Dougl.

URTICACEÆ.

Ulmus campestris L.
Urtica lyallii Wats.

ARISTOLOCHIACEÆ.

Asarum caudatum Lindl.

POLYGONACEÆ.

Polygonum amphibium L.
Polygonum aviculare L.
Polygonum aviculare L., var. *vegetum* Ledeb.
Polygonum convolvulus L.
Polygonum erectum L.
Polygonum fowleri Robinson.
Polygonum hydropiperoides Michx.
Polygonum lapathifolium L.
Polygonum minimum Wats.
Polygonum paronychia Cham. & Schlecht.
Polygonum persicaria L.
Polygonum spergulariæforme Meisn.
Rumex acetosella L.
Rumex conglomeratus Murr.
Rumex crispus L.
Rumex obtusifolius L.
Rumex obtusifolius L., var. *discolor.*
Rumex occidentalis Wats.
Rumex persicarioides L.
Rumex pulcher L.

CHENOPODIACEÆ.

Atriplex patula L.
Atriplex patula L. var. *hastata* (L.) Gray.
Chenopodium album L.
Chenopodium humile Hook.
Chenopodium leptophyllum (Moq.) Nutt.
Salicornia ambigua Michx.
Suæda maritima (L.) Dumort.

AMARANTHACEÆ.

Amaranthus retroflexus L.

NYCTAGINACEÆ.

Abronia latifolia Esch.

CARYOPHYLLACEÆ.

Arenaria macrophylla Hook.
Arenaria serpyllifolia L.
Cerastium campestre Greene.
Cerastium viscosum L.
Dianthus armeria L.
Lychnis vespertina L.
Sagina crassicaulis Wats.
Sagina occidentalis Wats.
Saponaria officinalis L.
Silene anglica L.
Silene antirrhina L.
Silene gallica L.
Silene menziesii Hook.
Silene noctiflora L.
Silene scouleri Hook
Spergula arvensis L.
Spergula sativa Boenn.
Spergularia marina (L.) Griseb.
Spergularia rubra radicans Presl.
Stellaria borealis Bigel., var. *alpestris* (Fries) Britt.
Stellaria brachypetala Bong.
Stellaria crispa Cham. & Schlecht.
Stellaria longipes Goldie.
Stellaria media (L.) Cyrill.
Stellaria nitens Nutt.

PORTULACACEÆ.

Calandrinia caulescens menziesii Hook.
Claytonia dichotoma Nutt.
Claytonia howellii (Wats.) Piper.
Claytonia linearis Dougl.
Claytonia parviflora Dougl.
Claytonia parviflora Dougl., var. *depressa* Gray.
Claytonia parvifolia Moc.
Claytonia perfoliata Donn.
Claytonia sibirica L.
Claytonia spathulata Dougl.

NYMPHÆACEÆ.

Brasenia schreberi Gmel.
Nymphæa polysepala (Engelm.) Greene.

RANUNCULACEÆ.

Anemone lyallii Britt.
Anemone hudsoniana (DC.) Richards.
Anemone oregana Gray.
Anemone multifida Poir.
Aquilegia formosa Fisch.
Delphinium ajacis L.
Delphinium menziesii DC.
Myosurus apetalus lepturus Gray.
Ranunculus acris L.
Ranunculus aquatilis L.
Ranunculus aquatilis pantothrix (Brot.) Piper.
Ranunculus aquatilis L., var. *trichophyllus* Gray.
Ranunculus bongardi Greene.
Ranunculus bongardi Greene, var. *douglasii* Howell.
Ranunculus cymbalaria Pursh, var. *saximontana* Fernald.
Ranunculus flammula reptans (L.) Schlecht.
Ranunculus flammula (L.), var. *unalaschensis* (Bess.) Ledeb.
Ranunculus flammula (L.), var. *intermedius* Hook.
Ranunculus occidentalis Nutt.
Ranunculus orthorhynchus Hook.
Ranunculus othorhynchus Hook., var. *platyphyllus* Gray.
Ranunculus repens L.
Thalictrum occidentale Gray.

BERBERIDACEÆ.

Achlys triphylla (Smith) DC.
Berberis aquifolium Pursh.
Berberis nervosa Pursh.

PAPAVERACEÆ.

Eschscholzia californica Cham.
Papaver dubium L.
Papaver somniferum L.

FUMARIACEÆ.

Dicentra formosa DC.

CRUCIFERÆ.

Alyssum alyssoides (L.) Gouan.
Arabis hirsuta (L.) Scop.
Arabis glabra (L.) Bernh.
Arabis perfoliata Lam.
Brassica campestris L.
Cakile edentula (Bigel.) Hook.

Camelina sativa (L.) Crantz.
Capsella bursa-pastoris (L.) Medic.
Cardamine oligosperma Nutt.
Cardamine pennsylvanica Muhl.
Coronopus didymus (L.) Smith.
Dentaria tenella Pursh.
Draba verna L.
Erysimum occidentale (S. Wats.).
Hesperis matronalis L.
Lepidium menziesii DC.
Lepidium sativum L.
Lepidium strictum Rattan.
Neslia paniculata (L.)
Nasturtium palustre DC., var.
Radicula curvisiliqua (Hook.) Greene.
Radicula obtusa (Nutt.) Greene.
Radicula pacifica (Howell) Greene.
Raphanus sativus L.
Sisymbrium altissimum L.
Sisymbrium officinale L.
Sisymbrium officinale (L.), var. *leiocarpum* DC.

Crassulaceæ.

Sedum spathulifolium Hook.

Saxifragaceæ.

Heuchera cylindrica Dougl.
Heuchera micrantha Dougl.
Leptaxis menziesii (Pursh.) Raf.
Mitella pentandra Hook.
Ribes bracteosum Dougl.
Ribes divaricatum Dougl.
Ribes lacustre (Pers.) Poir.
Ribes lobbii Gray.
Ribes nigrum L.
Ribes sanguineum Pursh.
Saxifraga bongardi Presl.
Saxifraga integrifolia Hook.
Saxifraga rufidula (Small) Piper.
Tellima bulbifera Rydb.
Tellima grandiflora (Pursh) Dougl.
Tellima parviflora Hook.
Tiarella laciniata Hook.
Tiarella trifoliata L.

Rosaceæ.

Alchemilla occidentalis Nutt.
Amelanchier florida Lindl.
Cotoneaster pyracantha (L.) Spach.
Cratægus brevispina (Dougl.) Heller.
Cratægus oxycanthoides L.
Drymocallis wrangeliana (Fisch. & Lall.) Rydb.
Fragaria bracteata Heller.
Fragaria crinita Rydb.
Fragaria cuneifolia Nutt.
Fragaria helleri Holzinger.
Geum macrophyllum Willd.
Geum oregonense Scheutz.
Osmaronia cerasiformis (T. & G.) Greene.
Physocarpus opulifolius (L.) Maxim.
Potentilla anserina L.
Potentilla dichora Rydb.
Potentilla gracilis Dougl.
Potentilla monspeliensis L.
Potentilla palustris (L.) Scop.
Potentilla recta L.
Prunus demissa (Nutt.) Dietr.
Prunus emarginata (Dougl.) Walp.
Prunus emarginata villosa Sudw.
Pyrus diversifolia Bong.
Rosa gymnocarpa Nutt.
Rosa nutkana Presl.
Rosa pisocarpa Gray.
Rosa rubiginosa L.
Rubus chamæmorus L.
Rubus laciniatus Willd.
Rubus leucodermis Dougl.
Rubus macropetalus Dougl.
Rubus parviflorus Nutt.
Rubus spectabilis Pursh.
Sanguisorba occidentale Nutt.
Spiræa discolor Pursh.
Spiræa douglasii Hook.
Spiræa menziesii Hook.

Leguminosæ.

Cytisus scoparius (L.) Link.
Hosackia bicolor Dougl.
Hosackia denticulata Drew.
Hosackia parviflora Benth.
Lathyrus latifolius L.
Lathyrus maritimus (L.) Bigel.
Lathyrus nuttallii Wats.
Lathyrus pauciflorus Fernald.
Lupinus bicolor Lindl.
Lupinus lepidus Dougl.
Lupinus littoralis Dougl.
Lupinus micranthus Dougl.
Lupinus microcarpus Sims.
Lupinus nootkatensis Donn.
Lupinus polyphyllus Lindl.
Medicago apiculata Willd.
Medicago hispida Gaertn.
Medicago lupulina L.
Medicago sativa L.
Melilotus alba Desr.

Melilotus indica (L.) All.
Melilotus officinalis (L.) Lam.
Psoralea physodes Dougl.
Robinia pseudo-acacia Dougl.
Trifolium albopurpureum T. & G.
Trifolium cyathiferum Lindl.
Trifolium dubium Sibth.
Trifolium fimbriatum Lindl.
Trifolium hybridum L.
Trifolium incarnatum L.
Trifolium microcephalum Pursh.
Trifolium microdon Hook & Arn.
Trifolium oliganthum Steud.
Trifolium pratense L.
Trifolium procumbens L.
Trifolium repens L.
Trifolium tridentatum Lindl.
Trifolium variegatum Nutt.
Ulex europæus L.
Vicia americana Muhl.
Vicia americana truncata (Nutt.) Brewer.
Vicia angustifolia (L.) Reich.
Vicia gigantea Hook.
Vicia hirsuta (L.) S. F. Gray.
Vicia sativa L.
Vicia tetrasperma (L.) Moench.

GERANIACEÆ.

Geranium bicknellii Britt.
Geranium carolinianum L.
Geranium dissectum L.
Geranium molle L.
Geranium pusillum Burm.
Erodium cicutarium (L.) L'Her.
Erodium moschatum (L.) L'Her.
Euphorbia peplus L.
Euphorbia serphyllifolia Pers.

ACERACEÆ.

Acer douglasii Hook.
Acer macrophyllum Pursh.

RHAMNACEÆ.

Ceanothus sanguineus Pursh.
Ceanothus velutinus Dougl.
Rhamnus purshiana DC.

MALVACEÆ.

Malva moschata L.
Malva parviflora L.
Malva rotundifolia L.
Malva sylvestris L.
Sidalcea hendersonii Wats.

VIOLACEÆ.

Viola adunca Smith.
Viola glabella Nutt.
Viola howellii Gray.
Viola macloskeyi Lloyd.
Viola nuttallii præmorsa (Dougal.) Wats.
Viola palustris L.
Viola retroscabra Greene.
Viola sarmentosa Dougl. Macoun.
Viola sempervirens Greene.
Viola tricolor L.

ELEAGNACEÆ.

Shepherdia canadensis (L.) Nutt.

ONAGRACEÆ.

Boisduvalia densiflora (Lindl.) Wats.
Circæa pacifica Asch & Magn.
Epilobium adenocaulon Haussk.
Epilobium anagallidifolium Lam.
Epilobium angustifolium L.
Epilobium minutum Lindl.
Epilobium paniculatum Nutt.

ARALIACEÆ.

Fatsia horrida (Smith) B. & H.

UMBELLIFERÆ.

Angelica genuflexa Nutt.
Anthriscus sativa L.
Carum gairdneri (Hook. & Arn.) Gray.
Caucalis microcarpa Hook.
Cicuta douglasii (DC.) C. & R.
Cicuta purpurea Greene.
Cicuta vagans Greene.
Conioselinum gmelini (Cham. & Schlecht.) C. & R.
Conium maculatum L.
Daucus carota L.
Daucus pusillus Michx.
Heracleum lanatum Michx.
Hydrocotyle ranunculoides L.f.
Leptotænia dissecta Nutt.
Lomatium lævigatum (Nutt.) C. & R.
Lomatium nudicaule (Pursh) C. & R.
Lomatium utriculatum (Nutt.) C. & R.

Œnanthe sarmentosa Presl.
Osmorhiza divaricata Nutt.
Osmorhiza leibergii (C. & R.) Suksdorf.
Pastinaca sativa L.
Sanicula arctopoides H. & A.
Sanicula bipinnatifida Dougl.
Sanicula howellii C. & R.
Sanicula menziesii Hook. & Arn.

CORNACEÆ.

Cornus canadensis L.
Cornus nuttallii Audubon.
Cornus occidentalis (T. & G.) Coville.

ERICACEÆ.

Allotropa virgata T. & G.
Arbutus menziesii Pursh.
Arctostaphylos tomentosa (Pursh) Dougl.
Arctostaphylos uva-ursi (L.) Spreng.
Chimaphila ubellata (L.) Nutt.
Gaultheria ovatifolia Gray.
Hypopitys hypopitys (L.) Small.
Kalmia glauca Ait.
Pterospora andromedea Nutt.
Pyrola aphylla Smith.
Pyrola bracteata Hook.
Pyrola clata Nutt.
Pyrola picta Smith.
Pyrola picta dentata Smith.
Pyrola picta integra Gray.
Vaccinium cæspitosum Michx.
Vaccinium cuneifolium Nutt.
Vaccinium oxycoccus intermedius (Gray) Piper.

PLUMBAGINACEÆ.

Statice armeria L.

PRIMULACEÆ.

Anagallis arvensis L.
Centunculus minimus L.
Dodecatheon latifolium (Hook.) Piper.
Dodecatheon vulgare (Hook.) Piper.
Glaux maritima L.
Lysimachia thyrsiflora L.
Trientalis arctica Fisch.
Trientalis latifolia Hook.

GENTIANACEÆ.

Centaurium centaurium (L.) W. F. Wight.
Gentiana acuta Michx.
Gentiana sceptrum Griseb.
Menyanthes trifoliata L.

APOCYNACEÆ.

Apocynum androsæmifolium L.

CONVOLVULACEÆ.

Convolvulus arvensis L.
Convolvulus sepium L.
Cuscuta squamigera Engelm.
Cuscuta arvensis Beyrich.
Cuscuta epithymum Murr.

POLEMONIACEÆ.

Collomia heterophylla Hook.
Collomia grandiflora Dougl.
Gilia achilleæfolia Benth.
Gilia bicolor (Nutt.) Piper.
Gilia gracilis (Dougl.) Hook.
Gilia squarrosa H. & A.

HYDROPHYLLACEÆ.

Nemophila parviflora Dougl.
Nemophila sepulta Parish.
Phacelia linearis (Pursh) Holzinger.
Romanzoffia sitchensis Bong.

BORAGINACEÆ.

Allocarya plebeia Greene.
Amsinckia intermedia Fisch & Meyer.
Amsinckia lycopsoides Lehm.
Myosotis arvensis (L.) Hill.
Myosotis laxa Lehm.
Myosotis versicolor (Pers.) J. E. Smith.
Plagiobothrys tenellus (Nutt.) Gray.

VERBENACEÆ.

Verbena hastata L.

Labiatæ.

Lamium amplexicaule L.
Lycopus Americanus Muhl.
Lycopus uniflorus Michx.
Marrubium vulgare L.
Mentha arvensis L., var. *canadensis* (L.) Briquet.
Mentha spicata viridis L.
Micromeria chamissonis (Benth.) Greene.
Nepeta hederacea (L.) Trevisan.
Prunella vulgaris L.
Scutellaria galericulata L.
Stachys ciliata Dougl.

Solanaceæ.

Solanum nigrum var. *villosum* L.

Scrophulariaceæ.

Castilleja angustifolia bradburii (Nutt.) Fernald.
Castilleja levisecta Greenman.
Collinsia grandiflora pusilla Gray.
Collinsia tenella (Pursh) Piper.
Limosella tenuifolia Wolf.
Linaria vulgaris Hill.
Mimulus alsinoides Dougl.
Mimulus grandiflorus Howell.
Mimulus langsdorfii Donn.
Mimulus moschatus Dougl.
Mimulus nasutus Greene.
Orthocarpus attenuatus Gray.
Orthocarpus bracteosus Benth.
Orthocarpus hispidus Benth.
Orthocarpus pusillus Benth.
Rhinanthus crista-galli L.
Veronica arvensis L.
Veronica americana Schwein.
Veronica peregrina L.
Veronica serpyllifolia L.
Veronica scutellata L.
Veronica tournefortii C.C. Gmel.

Lentibulariaceæ.

Utricularia vulgaris L., var. *americana* Gray.

Orobanchaceæ.

Orobanche uniflora L.
Orobanche comosa Hook.
Orobanche pinetorum Gray.

Plantaginaceæ.

Plantago bigelovii Gray.
Plantago lanceolata L.
Plantago macrocarpa Cham. & Schlecht.
Plantago major L.
Plantago major L., var. *asiatica* (L.) Dcne.

Rubiaceæ.

Galium aparine L.
Galium aparine L., var. *vaillantii* (DC.) Koch.
Galium boreale L.
Galium trifidum pacificum Wiegand.
Galium triflorum Michx.
Sherardia arvensis L.

Caprifoliaceæ.

Linnæa americana Forbes.
Lonicera ciliosa (Pursh) Poir.
Lonicera hispidula Dougl.
Lonicera involucrata Banks.
Sambucus callicarpa Greene.
Sambucus glauca Nutt.
Symphoricarpus mollis Nutt.
Symphoricarpus racemosus Michx.

Valerianaceæ.

Valerianella anomala Gray
Valerianella congesta Lindl.

Cucurbitaceæ.

Echinocystis oregana T. & G.

Campanulaceæ.

Campanula scouleri Hook.
Specularia perfoliata (L.) A. DC.

Compositæ.

Achillea lanulosa Nutt.
Achillea millefolium L.
Adenocaulon bicolor Hook.
Agoseris grandiflora Nutt.

Agoseris laciniata (Nutt.) Greene.
Anaphalis margaritacea (L.) B. & H.
Anaphalis margaritacea occidentalis Greene.
Anaphalis margaritacea subalpina Gray.
Antennaria concolor Piper.
Antennaria howellii Greene.
Anthemis arvensis L.
Arctium minus Bernh.
Arctium minus Bernh., var. *tomentosum* Mill.
Arnica amplexicaulis Nutt.
Arnica latifolia Bong.
Artemisia suksdorfii Piper.
Aster douglasii Lindl.
Aster foliaceus.
Balsamorhiza deltoidea.
Bellis perennis L.
Bidens amplissima Greene.
Cichorium intybus L.
Chrysanthemum leucanthemum L.
Chrysanthemum parthenium (L.) Pers.
Cirsium arvense (L.) Scop.
Cirsium edule Nutt.
Cirsium lanceolatum (L.) Scop.
Cotula coronopifolia L.
Crepis capillaris (L.) Wallr.
Crocidium multicaule Hook.
Erigeron canadensis L.
Erigeron philadelphicus L.
Eriophyllum lanatum (Pursh) Forbes.
Franseria bipinnatifida Nutt.
Gnaphalium purpureum L.
Gnaphalium palustre Nutt.
Gnaphalium microcephalum Nutt.
Grindelia integrifolia DC.
Helenium autumnale grandiflorum (Nutt.) Gray.
Hieracium albiflorum Hook.
Hypochæris glabra L.
Hypochæris radicata L.
Lactuca scariola integrata Gren. & Godr.
Lactuca spicata (Lam.) Hitchc.
Lapsana communis L.
Luina hypoleuca Benth.
Madia exigua (Smith) Greene.
Madia racemosa (Nutt.) T. & G.
Madia sativa Molina.
Matricaria matricarioides (Less.) Porter.
Petasites speciosa (Nutt.) Piper.
Prenanthes alata (Hook.) Gray.
Senecio vulgaris L.
Senecio sylvaticus L.
Silybum marianum (L.) Gaertn.
Solidago elongata Nutt.
Solidago glutinosa Nutt.
Solidago lepida DC.
Sonchus asper (L.) Hill.
Sonchus oleraceus L.
Tanacetum vulgare L.
Taraxacum officinale Weber.
Tragopogon porrifolius L.

LIST OF MUSCI COLLECTED AND PRESENTED TO THE PROVINCIAL MUSEUM.

BY PROFESSOR JOHN MACOUN.

SPHAGNACEÆ.

Sphagnum acutifolium Russ & Warnst.
Sphagnum cuspidatum Russ & Warnst.
Sphagnum fuscum Von Klinggraeff.
Sphagnum papillosum Lindb.
Sphagnum squarrosum Pers.

ANDREÆACEÆ.

Andreæa petrophila Ehrh.

DICRANACEÆ.

Dicranella heteromalla Schimp.
Dicranum congestum Brid.
Dicranum fuscescens Turn.
Dicranum howellii.
Dicranum scoparum Hedw.
Dicranum strictum Drumm.
Dicranum subpalustre C. M. & Kindb.
Dicranum sulcatum Kindb.

CERATODONTEÆ.

Ceratodon pupureus Brid.
Distichium capillaceum Brunch & Schimp.

POTTIEÆ.

Leptotrichum flexicaule Hampe.
Barbula convoluta Hedw.
Barbula leptotricha C. M. & Kindb.
Barbula megalocarpa Kindb.
Barbula mucronifolia Bruch & Schimp.
Barbula ruralis Hedw.
Barbula subulata Beauv.
Barbula vinealis Braun.

GRIMMIEÆ.

Scouleria muelleri Kindb.
Racomitrium canescens Brid.
Racomitrium ericoides Bruch & Schimp.
Racomitrium heterostichum Brid.
Racomitrium varium.
Hedwigia ciliata Ehrh., var. *leucophæa* Schimp.
Braunia californica Lesq.
Braunia californica var. *pilifera* Lesq. & James.

ORTHOTRICHEÆ.

Amphoridium californicum Lesq. & James.
Ulota phyllantha Mitt.
Orthotrichum lyellii Hook & Tayl.
Orthotrichum puchellum Brunton.
Encalypta streptocarpa Hedw.

PHYSCOMITRIEÆ.

Funaria hygrometrica Sibth., var. *calvescens* Bruch & Schimp.

BARTRAMIEÆ.

Bartramia pomiformis Hedw.
Philonotis macounii Lesq. & James.
Philonotis fontana Brid.
Philonotis marchica Brid.

BRYEÆ.

Leptobryum pyriforme Schimp.
Webera albicans Schimp.
Webera nutans Hedw.
Bryum capillare Linn.
Bryum cirrhatum Hoppe. & Hornsch.
Mnium affine Bland.
Mnium glabrescens.
Mnium inclinatum Lindb.
Mnium insigne Mitt.
Mnium menziesii C. Muell.
Mnium spinulosum Bruch. & Schimp.
Mnium venustrum Mitt.

AULACOMNIUM.

Aulacomnium androgynum Schwaegr.
Aulacomnium palustre Schwaegr.

TIMMIEÆ.

Timmia austriaca Hewd.

GEORGIACEÆ.

Georgia genuflexa.

POLYTRICHEÆ.

Atrichum undulatum Beauv.
Catharinea undulata (L.) Web. & Mohr.
Pogonatum alpinum Roehl.
Pogonatum alpinum var. *septentrionale* Brid.
Polytrichum commune Lindb.
Polytrichum juniperinum Willd.
Polytrichum piliferum Schreb.
Polytrichum strictum Banks.

FONTINALEÆ.

Fontinalis antipyretica Linn.
Fontinalis chrysaphylla Card.
Fontinalis kinbergii Can. Musc.
Fontinalis patens.
Dichelyma cylindricarpum Aust.

NECKEREÆ.

Alsia abietina Sulliv.
Neckera douglasii Hook.
Neckera douglasii Hook., var. *macounii* Kindb.
Neckera menziesii Drumm.
Homalia macounii C. M. & Kindb.

LEUCODONTEÆ.

Antitrichia californica Sulliv.

HYPNEÆ.

Heterocladium heteroptoides Best.
Heterocladium heteroptoides var. *filicens* Best.
Thuidium crispifolium (Hook.) Kindb.
Camptothecium nuttallii Kindb.
Camptothecium lutescens Bruch. & Schimp.
Brachythecium albicans Bruch. & Schimp.
Brachythecium asperrimum Mitt.

Brachythecium rivulare Bruch. & Schimp.
Brachythecium rutabulum Bruch. & Schimp.
Brachythecium salebrosum Bruch. & Schimp.
Scleropodium cæspitosum Bruch. & Schimp.
Scleropodium calpophyllum.
Scleropodium obtusifolium Kindb.
Isothecium cardoti Kindb.
Isothecium breweriianum Lesq. & James.
Isothecium lentum Lesq. & James.
Isothecium myurellum Kindb.
Isothecium nuttallii.
Isothecium stoloniferum Brid.
Eurynchium stokesii Bruch. & Schimp.
Eurynchium semiasperum C. M. & Kindb.
Raphidostegium roellii Ren. & Card.
Thamnium liebergii.
Plagiothecium denticulatum Bruch. & Schimp.
Plagiothecium crichapherum.
Plagiothecium sylvaticum Bruch. & Schimp.
Plagiothecium undulatum Bruch. & Schimp.
Amblystegium serpens Bruch. & Schimp.
Amblystegium riparium Bruch. & Schimp.
Hypnum circinale Hook.
Hypnum curvifolium Hedw.
Hypnum cohearens.
Hypnum filicinum Linn.
Hypnum kneiffii Bruch. & Schimp.
Hypnum kneiffii var. *gracilescens* Bruch. & Schimp.
Hypnum palustre Huds.
Hypnum robustum Hook.
Hypnum subimponens Lesq.
Hypnum vernicosum Lindb.
Hylocomium splendens (Hedw.) Schimp.

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Reprints from the Journal of Geology—On the Structure and Classification of the Stromatoporoidea. M. Heinrich.

Reprints from the American Anthropologist (N.S.)—A Remarkable Pipe from North-western American. H. I. Smith.

Reprints from the American Anthropologist—Noteworthy Archæological Specimens from the Lower Columbia Valley. Harlan I. Smith.

Reprints from Science, N.S., Vol. XXIII., No. 588—Preliminary Notes on Archæology of the Yakima Valley. Harlan I. Smith.

Reprints from the American Journal of Science—The Problem of Continental Fracturing and Diastrophism in Oceanica. Chas. Schuchert.

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Proc. of the Paleontological Society—Correlation and Chronology in Geology on the Basis of Paleography. Charles Schuchert.

VICTORIA, B.C.:
Printed by William H. Cullin, Printer to the King's Most Excellent Majesty.
1918.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1918

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

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1919.

To His Honour Sir FRANK STILLMAN BARNARD, K.C.M.G.,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Provincial Museum of Natural History for the year 1918.

J. D. MACLEAN,

Provincial Secretary.

Provincial Secretary's Office,

Victoria, March 7th, 1919.

PROVINCIAL MUSEUM OF NATURAL HISTORY,
VICTORIA, B.C., March 7th, 1919.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

SIR,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1918, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1918.

Since the last Annual Report, although no actual field-work was undertaken, a great deal of time was devoted to the study collection in going through the specimens which have been collected from time to time and are stored in the annex. All the specimens have been rearranged, labelled, and listed, so as to make them more accessible to those who wish to consult them in the several branches of natural sciences.

In this building, which is not in any way fire-proof, is stored a very large and valuable collection of anthropological material, which, if it were to be destroyed by fire, would be impossible to duplicate; this also applies to a large number of totem-poles in the basement under this building. The older people of the aboriginal races of this Province are fast disappearing, and as the younger people do not appear to have any interest in the work done by their forefathers, it will be only a short time at the longest when all the old wood-carvings will be a thing of the past; although without doubt, in many portions of the Province, archæological specimens of the stone age may be unearthed in the vicinity of some of their old camp-sites.

This building also contains the Museum study series of bird-skins, numbering over 4,500 specimens. A number of the leading museums and ornithologists make application for the loan of specimens from time to time for comparison in determining species and subspecies, also for working out the distribution and migration of birds on this continent. The same applies to the mammal study collection, numbering nearly 1,500 specimens.

There is no way of accurately recording the number of visitors who visit the Museum during the year, as a large number of people, including children and Orientals, do not sign their names; however, a glance at the register shows that the average attendance is maintained, as over 30,500 persons having recorded their names in the book which is placed in the entrance-hall for that purpose.

It will be seen from the report on the Botanical section, written by Mr. W. R. Carter, Assistant Biologist, that Professor John Macoun, of Sidney, B.C.; J. M. Macoun, C.M.G., Chief of the Biological Division, Ottawa; Dr. C. F. Newcombe, Victoria; and others have still maintained their friendly interest in the Provincial Herbarium, by presenting specimens to fill in the gaps, principally of the Vancouver Island flora, and as Director I am pleased to say that in the Herbarium to-day there is to be found almost every plant and flowering shrub that is to be found on or recorded from Vancouver Island.

A large number of the specimens that were added this year to the Herbarium had been collected by Mr. W. R. Carter before he was appointed to the staff of the Provincial Museum.

Mr. E. H. Blackmore has continued to carry on the systematic work in the Entomological section; this work is done by Mr. Blackmore gratuitously, and he has written considerable material of interest to entomologists in this report, giving descriptions of new and rare specimens recently described or found in this Province.

A great deal of the time of the Director has been taken up with game matters during the year. I was instructed by the Attorney-General's Department to go over to Vancouver in the latter part of March, and take over the Game Department temporarily before it was handed over to the administration of the Provincial Police. This necessitated the Director being in Vancouver a considerable time each week until the offices were transferred to Victoria. The Director was also made Secretary of the Game Conservation Board by Statute, and has to give considerable of his time to that work, which is under the administration of the Honourable Attorney-General's Department.

The Director hopes that, if funds will permit this year, to carry on more scientific research in the field, so as to fulfil the object of the Provincial Museum.

Very little anthropological material was secured during the year; several small collections were offered to the Department for purchase, but owing to the fact that the appropriation was so limited and the strictest economy was to be exercised, it was thought advisable not to make any of these purchases at present. However, several good specimens of stone pestles (Nos. 3138 and 3139), also stone chisels (Nos. 3140, 3141, and 3142) and spear-points (Nos. 3143 to 3147), were collected many years ago at Port Haney, and presented by Mr. Hector Ferguson, of Vancouver, B.C., to the Provincial Museum. These specimens had been sent to the Provincial Library by mistake some time ago; however, they were finally located and transferred to this Department.

ENTOMOLOGY.

BY E. H. BLACKMORE.

Very little field-work has been done during the past season, but some of the material taken by the Museum collectors during the past three years has been further worked over and many interesting facts brought to light. We have kept in touch with several of the collectors in various parts of the Province, and have obtained some new records, together with an added knowledge of the distribution of many of our species, the results of which are embodied in the following pages.

The weather conditions were vastly different to those of the previous seasons; during the last three weeks in April of this year (1918) we had a continuation of bright sunshine with a temperature far above the average, which brought about the emergence of many species far in advance of their normal times of appearance. Amongst the Geometridæ this was especially noticeable, as in many cases they were from four to six weeks earlier than usual; in one case, *Cosymbria lumenaria*, a difference of two months, a specimen being taken in fine condition on April 27th in the Lower Fraser Valley. My earliest previous record of this species is June 15th, 1915, that particular year being rather an early one. It is generally taken from the first to the middle of July.

In August we had a very wet month (I am now referring to Vancouver Island and the Lower Fraser Valley), which is very unusual, as that month is practically the hottest and driest of the whole year. A very noticeable feature of the past summer was the prevalence of high winds for continued periods, a factor which militates greatly against the collection of specimens, especially of diurnals and geometers who will not attempt to fly in the face of a strong wind.

One of the outstanding features of the season in this district was the remarkable scarcity of noctuids, this being the poorest season by far, for many years, from a collecting point of view, although in the Interior conditions did not seem quite so bad.

The damage done by cutworms this year was very light as compared with the two previous seasons; this was rather to be expected, as the season following a particularly heavy outbreak is generally comparatively light, owing to the heavy increase of parasitism amongst the larvæ and pupæ, thus enabling nature to restore her balance.

Unfortunately, to offset this, there was a very heavy infestation of the forest tent-caterpillar (*Malacosoma pluvialis* Dyar); in fact, the heaviest infestation we have had for many years. In normal years they confine themselves to the trees and bushes on vacant lots and on the roadside, but this year they were in such numbers that they attacked everything in sight, invading gardens and orchards and defoliating all kinds of fruit and shade trees. Wherever one went their ugly, unsightly webs were in evidence. A remarkable feature of the late summer was the presence all over the Province in large numbers of *Aglais californica* Bdv. (the tortoise-shell butterfly). This butterfly occurs regularly in certain sections of the Province, but I do not think that it has ever been so abundant and reported from so many widely separated localities. Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, reported it from Fort George right through to Stuart Lake, all through the Cariboo and Chilcotin Districts down to Lillooet. In a letter under date of August 6th, Mr. A. W. Phair, who is a resident of the latter locality, says in part: "There is a very interesting outbreak here of what I take to be *Vanessa californica*. It is working at about 4,000 feet on a shrub with a heavy laurel-like leaf. The outbreak extends at least fifty miles in a straight line. The shrubs are all eaten off and one little branch would have about a hundred caterpillars on it."

Mr. Phair sent me some twenty pupæ, which emerged the day of their arrival, and it is curious to note that they are all about one-third less in size than the average, and, although I have specimens from all parts of the Province, these are the only dwarf ones I have seen. It may be the altitude, or, what to my mind is more probable, there was such an enormous number of them that they did not get sufficient food to eat, and consequently transformed into pupæ in a somewhat stunted state, which was reflected in the smaller size of the imagines. They also occurred from Cranbrook in the east, through the Keremeos District, down the valley of the

Lower Fraser, and all over Vancouver Island, quite a number appearing in Victoria, even invading the houses. This is the first time I have seen this species in this city during my eight years' residence here.

Another insect which was extremely prevalent throughout the same general localities as the one just mentioned was a noctuid moth (*Autographa californica* Edw.) commonly known as the alfalfa-looper. It is widely distributed in Western North America, but was only known as a pest in Canada since 1914, when a very severe outbreak occurred in this Province. It was so abundant that summer on Vancouver Island that wherever one went a score or more would fly up out of the grass at nearly every step one took. It belongs to one of the few groups of noctuid moths which fly in the daytime, and it is also attracted to certain flowers about sundown.

An important discovery of what may prove to be a serious pest was made by Mr. W. B. Anderson at Chase, B.C., in the early part of August, where one of the tussock-moths (*Hemerocampa vetusta gulosa* Hy. Edw.) was found to be devastating the Douglas fir. Further notes on this moth will be found under the heading of "Illustrated Lepidoptera."

Another interesting and important discovery, especially from an economic aspect, was the finding of the apple-maggot fly at Royal Oak, B.C., by Mr. W. Downes, Field Officer, Entomological Branch, Dominion Department of Agriculture, who is in charge of the Vancouver Island District. It has been identified by Dr. J. M. Aldrich as *Rhagoletis pomonella*. The only previous record of this fly in British Columbia is two specimens taken by Mr. R. C. Treherne at Penticton, B.C., on July 26th, 1916. Mr. Downes has also discovered that the host-plant is the common snowberry (*Symphoricarpus racemosua*) and has bred a number of flies from it. In Eastern Canada it is one of the worst of the fruit pests, but so far no signs of its attacking the apple in British Columbia have been observed.

Rare and Uncommon Insects taken in British Columbia during 1918.

In continuing this section, as was proposed in last year's report, we would like to impress upon the entomologists of this Province, especially those residing in the more outlying districts, the necessity of sending in records of their important captures, accompanied by full data, by December 31st of each year. It is only by this means that we shall get a fuller knowledge of our British Columbia species and their distribution, a knowledge which is most essential both from an economic and a taxonomic standpoint.

Victoria.—Although, as stated previously, the season was a poor one for noctuids generally, the writer has been fortunate in picking up a few species of more than passing interest.

A male specimen of *Apantesis ornata complicata* Wlk. was taken on June 16th. This pretty tiger-moth occurs regularly, but is very uncommon; three specimens in any one year in this district is the most that I have any record of.

On April 12th I took one specimen each of *Xylomyges rubrica* Harv. and *X. perlubens* Grt., at rest on an electric-light pole. These are the first records I have of these two species occurring in Victoria.

In Vancouver *rubrica* occurs regularly with *pulchella*, although much less common. *Perlubens* is plentiful at cherry-blossoms in some districts on the Mainland.

A specimen of *Trachea impulsa* Gue. was taken at light on July 6th, which is also a new record for this district; it has previously been recorded from Kaslo. Another new record for this district is *Autographa metallica* Grt., a specimen of which I took on June 21st; it occurs at Agassiz and in the Kettle Valley District. Other rare noctuids taken were *Polia variolata* Sm. and *Septis plutonia* Grt.

Amongst the Geometridæ it is interesting to note that two specimens of *Diactinia silaccata albolineata* Pack. were taken here for the first time, although I have taken it at points farther up the Island. One specimen was taken on April 30th in fine condition on a store window, and the other at rest on a fence on July 24th, thus indicating that it is double-brooded. Two specimens of *Hydriomena edenata grandis* B. & McD. were taken on electric-light poles on March 16th. They were both females, but could not be induced to lay eggs. This species is rather scarce here, although it is much more plentiful at Duncan, forty miles north of here.

Mr. W. Downes, of Oak Bay, took a nice specimen of *Polia restora* Sm. on August 3rd. This also occurs regular, but not more than one or two seem to be captured in any one year. He also took a specimen of that pretty little noctuid, *Sarrothripus revayana columbiana* Hy. Edw., on April 8th. This species seems exceedingly rare. Mr. Downes also took a geometer not previously recorded from Victoria—viz., *Euphyia luctuata* Schiff—on June 14th; also another specimen of *Eupithecia borealis* Hulst., the first records for British Columbia of this species being mentioned in last year's Museum Report, page 12.

Mr. W. B. Anderson whilst collecting noctuids at light took a nice specimen of the peach-blossom moth (*Euthyatira pudens* Gue.). This is an exceedingly rare moth in this district. He also took a short series of *Hydriomena crokeri* Swett on April 29th. This geometer is as a rule very uncommon and is extremely local. I do not know of any other locality in British Columbia where it has been taken, and even here it seems to be restricted to one section of the city. The same collector took a single specimen of *Erannis vancouverensis* Hulst. on November 30th. This is the first record since I took a solitary specimen here on November 22nd, 1914.

Mr. W. R. Carter, Assistant Biologist of the Provincial Museum, took a fine specimen of that uncommon noctuid, *Rhynchagrotis niger* Sm., on July 15th; also a specimen of *Autographa rectangulata* Kirby, which is a new record for this district. In the Report of the Provincial Museum, 1917, p. 12, mention was made of the taking of a specimen of *Neptyia phantasmaria* Streck, which, together with one other, were the only known records from Victoria. It is interesting to note that Mr. Carter took a specimen on September 16th in Beacon Hill Park; from that time on he visited the park daily, with the result that up to October 3rd he had taken twenty-six specimens (twenty-four males and two females). It has evidently started to breed here, and as it is a pine-feeder there is no doubt but what it will become established here from now on.

My theory is that odd specimens come over on the boats from Vancouver, where it is extremely common in September. They are probably attracted by the bright lights of the ship at night at Vancouver, and settle on some portion of the rigging, flying off the next morning in Victoria, as all specimens found have been in the immediate vicinity of the sea-shore.

Goldstream.—On July 3rd the writer took a trip up Mount MacDonald, one of the mountains to the south of Goldstream, and was fortunate enough to take a couple of male specimens of *Plebeius melissa* Edw., a rather rare butterfly on Vancouver Island. I was pleased to take this, as it had been eliminated from the 1906 Check-list of B.C. Lepidoptera, and I was rather undecided as to its inclusion in a new Check-list which is in preparation.

On another trip on July 5th to Mount Braden, which is west of Goldstream, I took a geometer which at first sight seemed new to me, but later I recognized it as *Stamnoctenis morrisata* Hulst., the first specimen of which was taken at Duncan last year (*vide* Report Provincial Museum, 1917, p. 13). I went again on July 8th to the same place and succeeded in taking another one, but an extended search failed to reveal any more specimens. Both of them were males and in fine condition.

Mr. A. W. Hanham, of Duncan, also took two at light and Mr. G. O. Day took one at Maple Bay, so the species looks like it was going to become established.

Other Heterocera of interest taken by the writer at Goldstream were *Autographa mappa* G. & R.; *A. corusca* Streck; *Enypia packardata* Tayl.; and *Hyperetis trianguliferata* Pack.

Vernon.—Mr. W. Downes took a specimen of *Pieris beckeri* Edw. on September 30th. This butterfly seems very uncomomn and is rare in British Columbia collections. He also took a fine specimen on May 24th of *Acronycta mansueta* Em., a rather rare noctuid, and a specimen of *Xanthorhœ ferrugata* on the same date, a geometrid which is not at all common.

Mr. M. Ruhman captured on April 26th one of our rarest arctids—*Phragmatobia fuliginosa borealis* Staud. To my knowledge there have been only three specimens taken in British Columbia—the one just mentioned, one taken by the late Captain R. V. Harvey at Vancouver on April 23rd, 1907, and one taken at Alberni, V.I., by Mr. W. R. Carter in May, 1915.

Kaslo.—Mr. J. W. Cockle has taken a specimen of *Macaria purcellata* Taylor, which is the first that has turned up since the types were taken; he has also taken *M. minorata incolorata* Dyar., which is a very rare geometer and was described from Kaslo in 1904.

NEW BRITISH COLUMBIA INSECTS.

The following twelve insects have been described as new to science during the year 1918. They comprise four species of Lepidoptera, three species of Hymenoptera, and five species of Diptera.

LEPIDOPTERA.

In Cont. Lept. No. Amer., Vol. IV., No. 2, p. 137, May, 1918, Messrs. Barnes and McDunnough describe a new geometrid under the name of *Eustroma fasciata*, from Ketchikan, Alaska, and Cowichan Lake, Vancouver Island, B.C. The types are one male and three females, one of the females being taken in June at Cowichan Lake. This new species is closely allied to *E. nubilata* Pack, which is fairly common throughout the Province, especially the second brood in the early fall. The chief distinguishing features are that in *fascita* the antemedian white band has much more regular edges and is less bent in at the costa, also that there is no trace of any yellow shading.

Hydriomena macdunnoughi Swett is described in the Can. Ent., Vol. L., No. 9, p. 296, September, 1918, from specimens taken at Atlin, B.C., on June 11th, 1914, by Mr. E. M. Anderson. This new species bears a close superficial resemblance to *H. ruberata* Frey., but differs materially in the male genitalia. In the 1906 Check-list of British Columbia Lepidoptera, *ruberata* was erroneously listed as occurring at Kaslo; we have no authentic records of the occurrence of this species in any part of British Columbia.

MICROLEPIDOPTERA.

In the Can. Ent., Vol. L., No. 7, p. 231 *et seq.*, Annette F. Brown describes several new species of Microlepidoptera, two of which are described from Field, B.C. One of them belongs to the family Yponomeutidæ and is named *Swammerdamia cuprescens*. Four species were bred from larvæ feeding from birch; they are gregarious and live in webs, pupating in August and appearing the following May. Larvæ were also taken at Glacier, B.C., feeding on alder, but for some reason or other failed to reach maturity. It is a close ally of the European *S. heroldella*, which is also a birch-feeder. The other one belongs to the family Gracilariidæ and is called *Ornix spirææifoliella*. This species is a leaf-miner and feeds on the under-side of the leaves of *Spirea sp.;* this also pupates in the fall and emerges in the following spring.

HYMENOPTERA.

The Ottawa Naturalist, Vol. XXXII., No. 4, p. 71, October 1918, contains a key to the species of the genus *Vespa*, occurring in Canada, by F. W. L. Sladen. In the course of his paper he describes four new forms, three of which occur in Canada and one in Alaska. The three occurring in Canada also occur in British Columbia and are as follows:—

(1.) *Vespa norvegicoides*, which has a range from Nova Scotia to British Columbia. It is closely related to *diabolica* Saus., which is our commonest wasp, and differs from it, amongst other minor details, by the yellow band on segment, one being narrower and uninterrupted; by the male antennæ being black beneath instead of testaceous; and by the hairs being longer and less dense.

(2.) *Vespa acadica*, recorded from Nova Scotia, New Brunswick, Ontario, and British Columbia; the specific localities for British Columbia being given as Kaslo and Victoria. This species makes an aerial nest and is near to *vidua* Saus., which occurs only in Ontario, as far as Canada is concerned.

(3.) *Vespa atropilosa*, described from one female and many workers. The female was taken at Lethbridge, Alta., while the workers or neuters were all taken in British Columbia, specific localities recorded being Vernon, Okanagan Landing, and Keremeos.

It is interesting to note that, out of eleven species of wasps known to occur in Canada, as many as eight of them are taken in British Columbia; these are enumerated in the following list:—

Vespa maculata Linn. This is the well-known "black hornet," which makes an aerial nest.
V. diabolica Saus. This species is found in Southern British Columbia up to an altitude of 5,000 feet.
V. norvegicoides Sladen.
V. arctica Rohw. (= *borealis* Lewis). Parasitic in nests of *V. diabolica.*
V. occidentalis Cr.
V. austriaca Pz. This a parasitic species and so far has only been recorded in this Province from Kaslo, in mid-July.
V. acadia Sladen.
V. atropilosa Sladen.

DIPTERA.

In the Annals of the Ent. Socy. of America, Vol. XI., No. 4, December, 1918, Mr. F. W. Pettey gives "A revision of the genus *Sciara* of the family Mycetophilidæ. In the course of his revision he describes some thirty new species from North America, two of which are from British Columbia. The first is *Neosicara lobosa*, described from one male collected at Carbonate, B.C., by a Mr. J. C. Bradley in July, 1908, at an altitude of 2,600 feet. Carbonate is situated about twenty miles south-east of Golden.

The other is *Neosciara ovata*, described from one male taken at Howser, B.C., by Mr. Bradley on June 22nd, 1905. Howser is situated on the Lardeau River about thirty-five miles north of Kaslo. It would be as well to state here that *Neosciara* is a new genus erected by Mr. Pettey, to include those species which have no setæ on the cubitus and media, and which would formerly have been placed under the old genus *Sciara*, which have setæ on these veins.

Two species of the genus *Drapctis*, belonging to the family Empididæ, are described by A. L. Melander in the Annals of Ent. Socy. Amer., Vol. XI., No. 2, June, 1918. The first is *Drapetis aliternigra*, which is very widely distributed, it being found in New York, Massachusetts, Pennsylvania, South Dakota, Texas, and British Columbia. The second is *Drapetis infumata*, described from two specimens, the type specimen being taken at Nelson, B.C., on July 17th, 1910, and the paratype at Priest Lake, Idaho, on August 1st, 1915.

Sarcophaga vancouverensis Parker is described in the Can. Ent., Vol. L., No. 4, p. 122, April, 1918. This new species was described from eight specimens (seven males and one female) taken by Mr. R. S. Sherman on Savary Island, B.C., and at Vancouver, B.C., on various dates from May 12th to July 3rd, 1916.

We extend our congratulations to Mr. Sherman on his discovery of a new species, as he has done so much to advance our knowledge of the dipterous fauna of this Province.

We would like to mention an article written by Dr. A. E. Cameron (who was Dominion Field Officer in charge of the pear-thrips investigation at Royal Oak, B.C., for two years) and published in the Annals of the Ent. Socy. Amer., Vol. XI., No. 1, March, 1918. The article is entitled the "Life-history of the Leaf-eating Crane-fly, *Cylindrotoma splendens* Doane." It gives a complete account of its habits and its life-history from the egg to the image.

It is illustrated with some very fine drawings by the author, representing the larvæ and its most important parts, the pupa and the image. The larvæ of this crane-fly was discovered at Westholme, on Vancouver Island, some forty miles north of Victoria. The value of the discovery lies in the fact that this represents the first finding of the immature stages of any species of this genus on the American Continent.

ILLUSTRATED LEPIDOPTERA.

We have thought that it may be of more interest and benefit to the entomologists in various parts of the Province to describe more fully the insects illustrated in the plates contained in the Annual Reports of the Provincial Museum, and a beginning is made with those moths figured on the two plates accompanying this article. The species in the following annotated list are given in their proper scientific order, the numbers appearing before each name corresponding with a similar number in Messrs. Barnes and McDunnough's Check-list of No. Amer. Lepidoptera, February, 1917. Those with a star prefixed to them have been described since that list was published.

NOCTUIDÆ (PLATE I.).

1315. *Euxoa quinquelinea* Sm. This is a moth that has not hitherto been recorded from British Columbia. Recently, upon working over a collection of noctuids made by Mr. W. H. Danby at Rossland, B.C., some twenty years ago, I found several species that were entirely new to me. These were subsequently submitted to Dr. J. McDunnough, of Decatur, Ill., for identification, some of them proving new to British Columbia. This species is one of them; it is evidently a mountain species, as its habitat is the Sierra Nevadas of California.

E. lutulenta, which was also described by Dr. J. B. Smith at the same time (*vide* Trans. Am. Ent. Socy., XVII., p. 50, 1900), is now placed as a geographical race of *quinquelinea*. We also have a specimen of this form taken at Vernon, B.C., in 1916.

1682. *Polia negussa* Sm. This was also taken by Mr. Danby at Rossland, B.C., in 1898, and is also new to British Columbia. It was described by Smith in the Can. Ent., XXXII., August,

PLATE I.

NOCTUIDÆ AND LYMANTRIIDÆ.

Gortyna pallescens Sm.
Alberni, B.C. (W. R. Carter).
(Very rare.)

Arzama obliqua Walk.
Duncan, B.C. (E. M. Skinner).
(New to British Columbia.)

Andropolia ædon Grt.
Duncan, B.C. (E. M. Skinner).
(New to British Columbia.)

Euxoa quinquelinea Sm.
Rossland, B.C. (W. H. Danby).
(New to British Columbia.)

Ipimorpha nanaimo Barnes.
Victoria, B.C. (E. H. Blackmore).
(Very rare.)

Polia variolata Sm.
Victoria, B.C. (E. H. Blackmore).
(Very rare.)

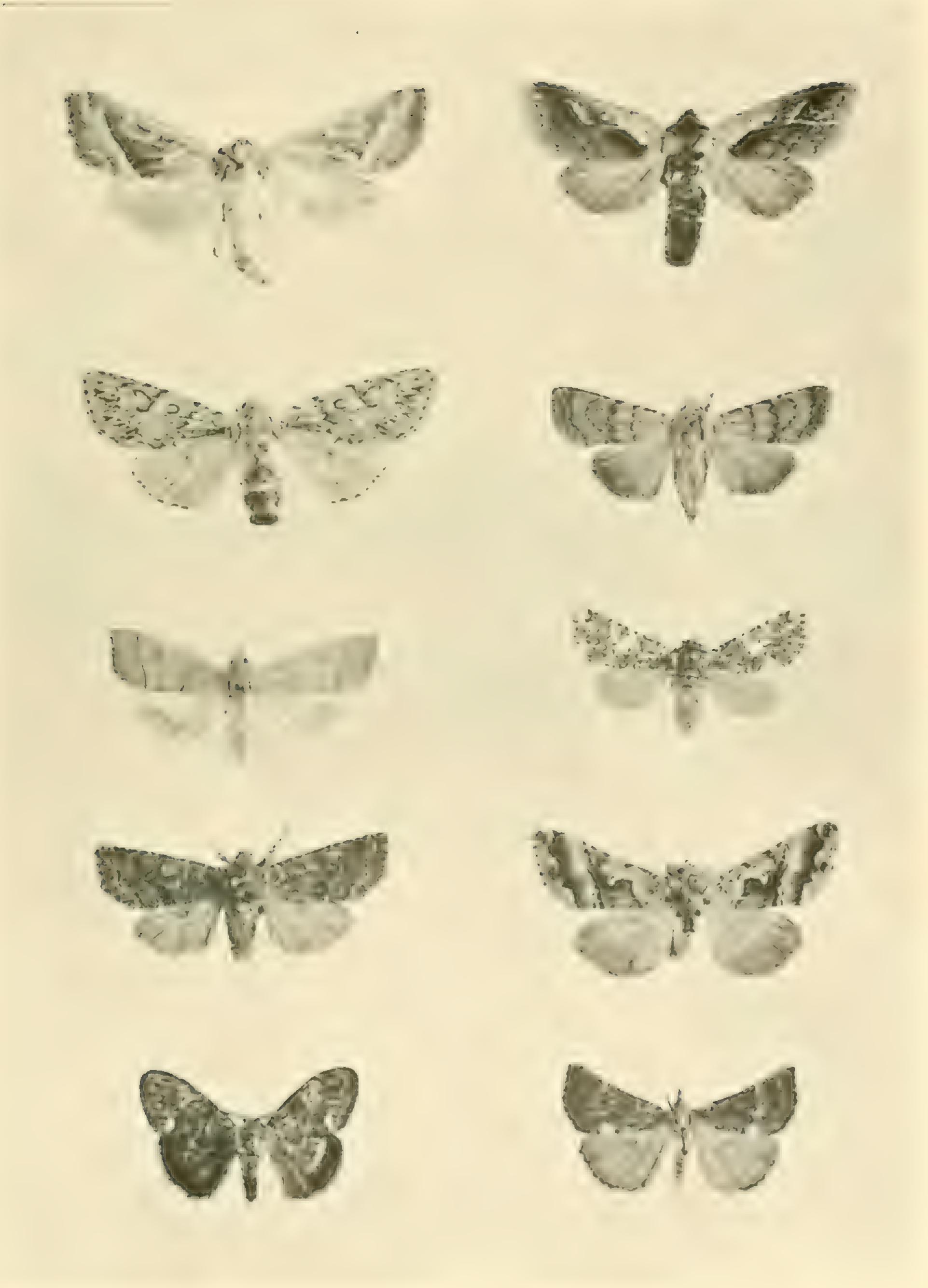
Polia negussa Sm.
Rossland, B.C. (W. H. Danby).
(New to British Columbia.)

Autographa V-alba Ottol.
Rossland, B.C. (W. H. Danby).
(New to British Columbia.)

Hemerocampa vetusta gulosa Hy. Edw.
Chase, B.C. (W. B. Anderson).
(New to British Columbia.)

Bomolocha toreuta Grt.
Duncan, B.C. (G. O. Day).
(Very rare.)

PLATE I



1900, from two males and two females taken by F. H. Wooley Dod at Calgary, Alta. It is very closely allied to *segregata* Sm. and *gussata* Sm., Dr. McDunnough being of the opinion that they are probably forms of one species.

P. segregata was described from Laggan, Alta., and is recorded from Kaslo, B.C. I have a specimen of it from Sicamous, B.C. It is also a mountain form and evidently very uncommon. These two species are very much alike in maculation, *negussa* being more reddish-brown in colour and lacking the black markings of *segregata*.

1702. *Polia variolata* Sm. This specimen was described from Washington Territory by Smith in 1887, Proc. U.S. Nat. Mus., X., p. 467, from one male and one female. We have a specimen in the Museum collection labelled " Victoria, B.C.," and presumably taken about 1902. There is no other record of its occurrence in British Columbia that I know of until the capture of the specimen figured in the plate, on July, 1918. It must be exceedingly rare when a period of sixteen years elapses without its capture being recorded, especially in a district which is continually and regularly worked over.

2646. *Gortyna pallescens* Sm. The specimen figured was taken by Mr. W. R. Carter at Alberni, B.C., in August, 1915; one was also taken by Mr. Downes at Armstrong, B.C., on August 28th. It was also recorded in the 1906 Check-list of B.C. Lepidoptera, under the name of *medialis* Sm., as occurring at Kaslo.

In Bulletin 52, U.S. Nat. Mus., Dr. Dyar places *pallescens* as a synonym of *medialis* Sm., but in Barnes and McDonnough's new Check-list they are treated as separate, although closely allied species. In the British Columbia Check-list the name *medialis* should be eliminated, and *pallescens* substituted for it. It is interesting to note that this uncommon insect has been taken in two districts whose climatic conditions are the exact opposite of each other. Alberni being an extremely wet district, while Armstrong is in the hot dry belt.

2524. *Andropolia ædon* Grt. One specimen without date taken by the late E. M. Skinner at Quamichan Lake, near Duncan, presumably in 1896. This has not hitherto been recorded from British Columbia. Its habitat is Colorado, Nevada, and Washington. One of the types is in the British Museum.

2725. *Ipimorpha nanaimo* Barnes. This delicate ochre-coloured moth is very uncommon in this district. There is a specimen in the Museum collection taken in Victoria on August 2nd, 1898. I have no other record from here until the one I took at rest on a fence on August 18th, 1918, just twenty years later. The one in the Museum collection was determined many years ago by Dr. Smith as *pleonectusa* Grt., which, although agreeing in maculation, is decidedly smaller and darker in coloration, being of a very dark fawn colour on both primaries and secondaries. The latter occurs throughout the Atlantic States, Colorado, and Utah. Mr. A. W. Hanham, of Duncan, B.C., took this latter species in Victoria many years ago, and I was fortunate enough to take one specimen in perfect condition at light on August 25th, 1916.

2784. *Arzama obliqua* Wlk. This species is new to British Columbia and was taken by the late E. M. Skinner at Quamichan Lake on June 26th, 1906. This is a very interesting record, as it is rather surprising to find it on the Pacific Coast; it is distributed over a wide area on the American Continent, from Eastern Canada south to Florida, and thence west to the Mississippi. It is a reed-feeder, the larva feeding from the top downwards until the whole of the reed is eaten out, then returning to the top and forming its pupa there. *Bellura gortynoides* Wlk. is very closely allied, and is reported from Wellington and Vancouver, although I have not as yet seen the species.

3245. *Autographa V-alba* Ottol. Taken by Mr. W. H. Danby at Rossland about the year 1900, but without specific date. This is also new to British Columbia, and was described from Wyoming by Dr. Ottolengui in Jn. N.Y. Ent. Socy., X., p. 73, 1902. It is a very pretty species and bears a strong superficial resemblance to *speciosa*, from which it can readily be distinguished by the shape of the " Y " mark.

3571. *Bomolocha toreuta* Grt. This species was referred to in the Provincial Museum Report, p. 12, 1917. In the 1906 B.C. Check-list it is reported from Cameron Lake, and one specimen was taken by Mr. R. C. Treherne at Agassiz on August 1st. This latter record would indicate that it is double-brooded, or at least partially so, as Mr. Day's specimens emerged in May from larvæ taken the previous August. The ground colour is a rich smoky brown, the white blotch in the inner margin being very striking. It occurs from New York to Texas.

LYMANTRIIDÆ (PLATE I.).

3704 (*b.*) *Hemerocampa vetusta gulosa* Hy. Edw. This moth, which has hitherto not been recorded from British Columbia, is very interesting from both a systematic and economic standpoint. It was discovered by Mr. W. B. Anderson, who is Dominion Inspector of Indian Orchards, on one of his periodical trips in the Interior. It was taken at Chase, B.C., where it was doing much damage to the Douglas fir. Imagines and full-fed larvæ were taken together on August 6th, showing it to be double-brooded. The females are wingless and live solely for the purpose of oviposition; having laid her eggs she covers them with hairy scales, which she plucks from her body and mixes them with a gummy secretion, which on drying becomes hard and brittle; as her mission in life is then ended, she dies.

The full-fed larvæ noted above spun up about August 12th, emerging in the breeding-cage on September 1st and 2nd. There are three closely allied forms—*vetusta* Bdv., described from the Coast region of California in 1852; *gulosa* Hy. Edw., described from the same general locality in 1881; and *cana* Hy. Edw., described from the Sierra Nevadas of California in the same year. After a careful comparison with the descriptions published by Neumoegen and Dyar in their "Preliminary Revision of the Bombyces of America," Jn. N.Y. Ent. Socy., Vol. II., p. 29, March, 1894, I have not the slightest hesitation in referring this British Columbia form to *gulosa*, which together with *cana* are made races of *vetusta* in Barnes and McDunnough's new Check-list. It is also a near relative of *H. leucostigma* A. & S. (the white-marked tussock-moth), whose ravages upon shade-trees and shrubbery in the Atlantic States are well known.

GEOMETRIDÆ (PLATE II.).

4002 (*a.*) *Dysstroma formosa boreata* Tayl. This is rather an interesting record, as its capture is of very rare occurrence. It was taken near Victoria by Mr. W. Downes on July 23rd, 1917. It was described in the Can. Ent., Vol. XLII., p. 87, March, 1910., from two specimens taken by Mr. T. Bryant near the Stikine River, in Northern British Columbia, on July 24th and 25th, 1905. In Barnes and McDunnough's new Check-list it is placed as a race of *formosa* Hulst., and in my opinion rightly so, as the maculation is practically the same, with the exception of the extra basal bar, which is quite distinct and perfectly black instead of red or orange.

Typical *formosa*, which was described from Colorado, also occurs in British Columbia, the writer having in his cabinet a rather poor specimen taken at Lillooet on June 23rd, 1916, and there is a specimen in the Swett collection taken by the late Mr. Livingstone at Cowichan Bay, B.C.

* *Hydriomena macdunnoughi* Swett. This specimen, new to science, is noted fully under the heading of "New British Columbian Insects."

* *Hydriomena perfracta exasperata* B. & McD. In last year's Museum Report mention was made of the new forms of *Hydriomena*, described by Messrs. Barnes and McDunnough in their revision of that group, Cont. Lept. No. Amer., Vol. IV., No. 1, May, 1917. The specimen figured is one of them and was taken by the writer near Victoria on May 19th, 1914, whilst beating for Geometridæ. It was described from two specimens, both males, one taken at Departure Bay and the other at Wellington, both localities being on Vancouver Island; it is a geographical race of *perfracta* Swett, which is taken in the Catskill Mountains, N.Y. The latter was originally described as a variety of *cœrulata* Fabr. (*autumnalis* Strom), but is now considered as distinct, on account of difference in the shape of the uncus in the two forms.

4360 (*a.*) *Phasiane respersata teucaria* Stkr. This little geometrid was listed in the 1906 B.C. Check-list as *Macaria teucaria* with a question-mark; later it was determined as *respersata* Hulst., but finally it has been identified as *teucaria*, which was described from Seattle, Wash., and is really only a large form of *respersata*, whose nimotypical locality is Colorado. *Teucaria* occurs on Mount Tzouhalem, near Duncan, and although I have collected assiduously in the vicinity of Victoria for the past eight seasons, I had only taken two specimens until last May (1918), when I took thirty-seven at Mount Tolmie on May 28th. In a long series they are rather variable as regards the intensity of the markings, and also in the presence or absence of the intradiscal line; in some forms this line is present from the costa to the median vein only, giving the insect quite a different appearance. (For earlier notes on this species *see* Proc. Ent. Socy., B.C., No. 6, p. 110, June, 1915.)

4372 (*b.*) *Phasiane neptaria sinuata* Pack. Both *neptaria* Gu. and *sinuata* have been listed in previous B.C. Check-lists as occurring here, the latter being retained in the list on account

PLATE II.

GEOMETRIDÆ.

Lycia ursaria Walk.
Rossland, B.C. (W. H. Danby).
(New to British Columbia.)

Gabriola dyari Taylor.
Victoria, B.C. (E. H. Blackmore).
(Very uncommon.)

Euchlæna albertanensis Swett.
Armstrong, B.C. (W. Downes).
(New to British Columbia.)

Dysstroma formosa boreata Taylor.
Victoria, B.C. (W. Downes).
(Very rare.)

Gonodontis formosa Hulst.
Lillooet, B.C. (A. W. Phair).
(New to British Columbia.)

Phasiane respersata teucaria Streck.
Victoria, B.C. (E. H. Blackmore).

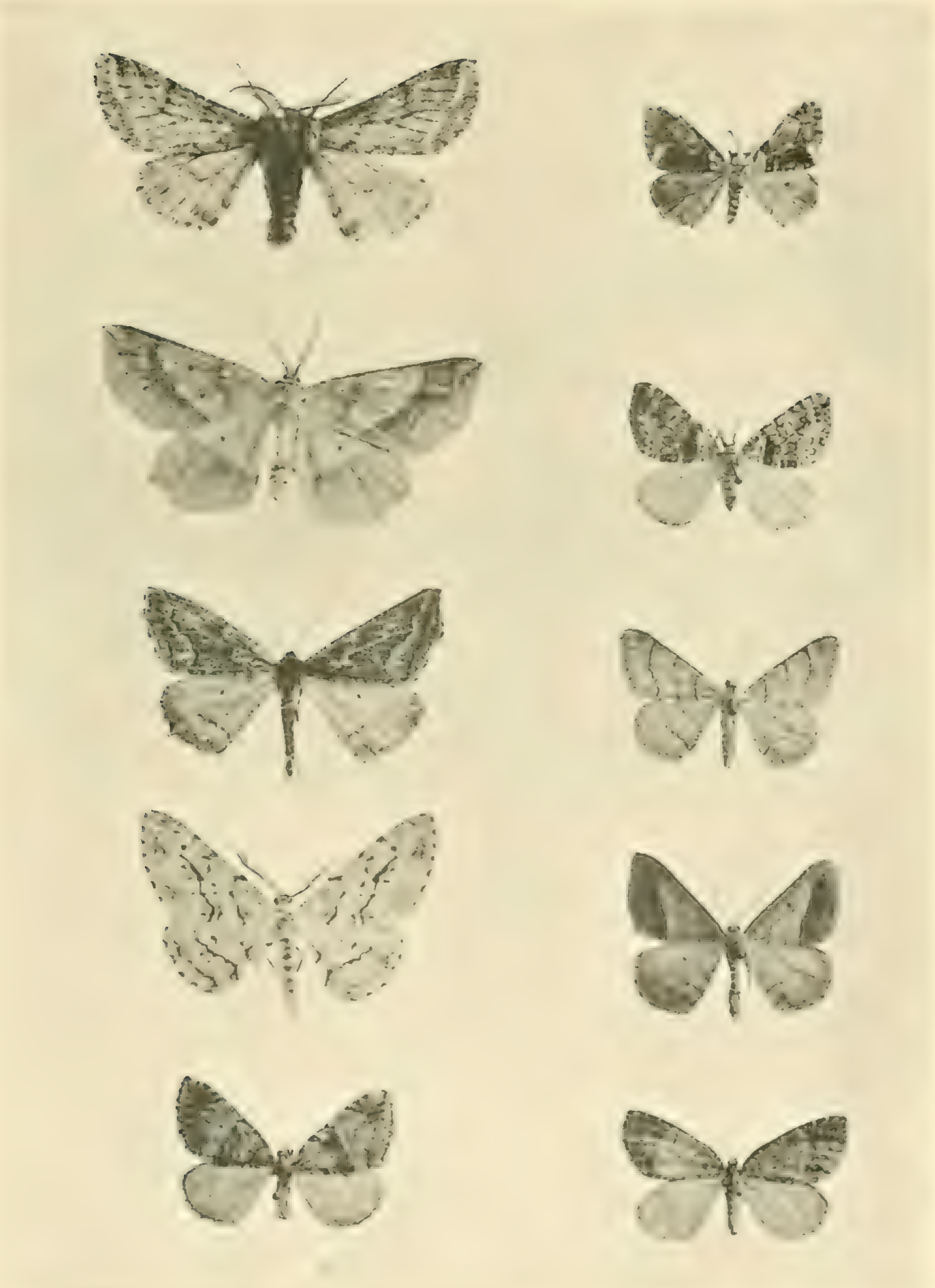
Cleora albescens Hulst.
Duncan, B.C. (G. O. Day).
(Very rare.)

Phasiane neptaria sinuata Pack.
Goldstream, B.C. (E. H. Blackmore).

Hydriomena perfracta exasperata B. & McD.
Victoria, B.C. (E. H. Blackmore).
(New to British Columbia.)

Hydriomena macdunnoughi Swett.
(Paratype male.)
Atlin, B.C. (E. M. Anderson).
(New to science.)

PLATE II.



of its being described from one male specimen taken at Victoria by a Mr. G. R. Crotch, who collected in this district, about the year 1873. Apparently this species had disappeared, and all the specimens taken in recent years have been named *neptaria*, which was described from California.

The solution to this apparent disappearance lies in the fact that the two species are practically alike in maculation, the only difference being the larger size of *sinuata;* therefore the latter is now considered to be a northern race of *neptaria.*

Sinuata occurs right across the southern portion of British Columbia from Vancouver Island to the Rocky Mountains. The specimen figured is typical. *Neptaria* must now be eliminated from our Check-list.

4554. *Cleora albescens* Hulst. One of our very rare geometers. It was described from Seattle, Wash., by Hulst in Trans. Am. Ent. Socy., XXIII., p. 355, September, 1896. There are very few records of its capture in British Columbia. The late Rev. G. W. Taylor took it many years ago at Wellington; the late A. H. Bush took one specimen at Vancouver on May 22nd, 1902; and Mr. G. O. Day took two or three at Maple Bay, near Duncan, in August, 1911; and although it has been diligently searched for, none have been taken since. These are the only authentic records that I know of. This and *excelsaria* Strks., which was figured in Annual Report of the Provincial Museum, 1917, Plate II., were previously placed in the genus *Selidosema;* but this genus, together with the genus *Alcis*, has been discarded, and all the species belonging to these two genera have been transferred to the genus *Cleora.*

4608. *Lycia ursaria* Walk. This is an Atlantic States species and is entirely new to our fauna; it was taken by W. H. Danby at Rossland some eighteen years ago. It was described from Albany, N.Y., in 1860, and the type specimen is in the D'Urban collection of North America Lepidoptera, which is now the property of the Entomological Society of Ontario, and is in the collection of the Agricultural College at Guelph.

4612. *Gabriola dyari Tayl.* Described from four male specimens taken in August, 1903, on Gabriola Island, opposite Nanaimo. In his description (Can. Ent., Vol. XXXVI., p. 256, September, 1904) Taylor says that it seems to be not uncommon on Vancouver Island and that he has not seen a female. It may be more common in the Nanaimo District, but it is not so in the vicinity of Victoria.

I have taken four specimens (three males and one female) in six years of collecting exclusively for geometrids. The female has the same markings as the male, but is larger, the male measuring in alar expanse 24 mm., while the female expands to 28 mm., the antennæ of the female is filiform, while the male antennæ are heavily pectinated.

4691. *Gonodontis formosa* Hulst. Taken at Lillooet on October 4th, 1917, by Mr. A. W. Phair. This species is new to British Columbia, and its capture so far north is rather unexpected, as its habitat ih Colorado and Southern California. The specimen figured is a little worn; when in a fresh condition it is evidently a rather handsome insect.

* *Euchlæna albertanensis* Swett. On looking over a collection of Lepidoptera made by Mr. W. Downes at Armstrong, B.C., a few years ago, I came across four specimens of a species of *Euchlæna* that were decidedly different to any that I had seen before. Knowing that the species going under the name of *pectinaria* Pack. in our British Columbia collection was wrongly named, I listed them provisionally as *pectinaria*, especially as they agreed fairly well with Packard's description in Mon. Geom. U.S. Geol. Survey, Vol. X., 1876. Recently in sending some material to Dr. McDunnough for identification I included one of these Armstrong specimens, and he informs me that it is *albertænsis* Swett. This new species was described in Can. Ent., Vol. 49, p. 351, October, 1917, the male type coming from Calgary, Alta., and the female type from Edmonton, Alta.

Mr. Downes's specimens comprise three males and one female, and were captured on April 25th and 30th, 1914; they are the only specimens I have seen, although I have worked over considerable material taken at Vernon and Okanagan Landing during the last three years.

Mr. Downes informs me, however, that the insect fauna of Armstrong in some respects differs very materially from that of Vernon, although the two localities are only twelve miles apart. There is more bush at Armstrong and the climate is more humid. It may be as well to state here that the moth going under the name of *pectinaria* in local collections is in reality *E. tigrinaria sirenaria* Streck.

Botany.

As no field-work of any description was undertaken during the season of 1918, there is little to chronicle in the Botanical section of the Provincial Museum during this period; however, the collection in the Provincial Herbarium has been materially increased and a number of specimens not hitherto in the collection have been added from the following sources:—

Additions to the collection of Professor John Macoun, received from Mr. J. M. Macoun, Chief of the Division of Biology, Geological Survey, Ottawa:—

Marsileaceæ.

Marsilea vestita Hook.

Salviniaceæ.

Azolla caroliniana Willd.

Lycopodiaceæ.

Lycopodium annotinum L., var. *alpestre.*
Lycopodium selago L.
Lycopodium selago var. *miyoshianum* Makino.
Lycopodium sitchense Rupr.

Najadaceæ.

Phyllospadix scouleri Hook.
Phyllospadix torreyii Wats.
Potamogeton pusillus L.
Potamogeton prælongus Wulf.
Potamogeton zosterifolius Schum.
Ruppia maritima L.
Zostera marina L.

Juncaginaceæ.

Triglochin maritima L.

Araceæ.

Lysichiton kamtschatcense Schott.

Orchidaceæ.

Habenaria gracilis Wats.

Saxifragaceæ.

Ribes bracteosum Dougl.
Saxifraga bongardi Presl.
Saxifraga emarginata Small.
Saxifraga integrifolia Hook.
Saxifraga mertensiana Bong.
Saxifraga rufidula Small.
Saxifraga vespertina Small.

Callitrichaceæ.

Callitriche bolanderi Heg.

Gentianaceæ.

Gentiana sceptrum Griseb.

Scrophulariaceæ.

Orthocarpus erianthus Benth.

Compositæ.

Arnica gracilis Rydb.
Artemisia suksdorfii Piper.
Cotula coronopifolia L.
Crocidium multicaule Hook.
Tanacetum huronense Nutt.

A collection of Musci from Professor John Macoun, Sidney, V.I., B.C.:—

Sphagnaceæ.

Sphagnum capillaceum Andrews, var *tenellum.*
Sphagnum capillaceum Andrews, var *rubellum.*
Sphagnum fuscum Von Klinggraeff.

Dicranaceæ.

Oncophorus virens Brid.

Weisieæ.

Dicranoweisia cirrhata Lindb.
Dicranoweisia crispula Lindb.

Ceratodonteæ.

Ceratodon purpureus Brid.
Distichium capillaceum Bruch & Schimp

POTTIEÆ.

Didymodon rubellus Bruch & Schimp.

GRIMMIEÆ.

Grimmia apocarpa Hedw.
Grimmia calyptrata Hook.
Racomitrium hypnoides.

ORTHOTRICHEÆ.

Orthotrichum rupestre Schleich.

BARTRAMIEÆ.

Philonotis fontana Brid.
Bartramia halleriana Hedw.

PHYSCOMITRIEÆ.

Funaria hygrometrica Sibth.

BRYEÆ.

Bryum duvalii Voit.
Leptobryum pyriforme Schimp.
Mnium punctatum Hedw.

AULACOMNIEÆ.

Aulacomnium palustre Schwaegr.

POLYTRICHEÆ.

Polytrichum juniperinum Willd.
Polytrichum strictum Banks.

HYPNACEÆ.

Amblystegium riparium Bruch & Schimp.
Amblystegium serpens Bruch & Schimp.
Calliergon schreberi Willd.
Camptothecium nitens Schimp.
Hypnum cristi-castrensis Linn.
Hypnum curvifolium Hedw.
Hypnum fluitans Linn.
Hypnum hamulosum Bruch & Schimp.
Hypnum lycopodiodes Schwaegr.
Hypnum uncinatum Hedw.

A small collection of grasses and plants collected in British Columbia by Mr. J. M. Macoun.

A short series from Lytton collected by Mr. W. B. Anderson. A collection of Vancouver Islands plants, approximately 650 specimens, from W. R. Carter, Assistant Biologist. This collection was made prior to Mr. Carter being appointed to the staff of the Provincial Museum, and it represents chiefly the flora of the Alberni District and illustrates the luxuriant growth of the Humid Transition area; this collection includes original specimens of a number of plants not previously recorded from Vancouver Island, together with two which are new to Canada.

These collections have been mounted by Miss H. J. Hendry, Recorder in the office of the Museum, and placed in the Herbarium of the Provincial Museum.

The following list taken from these collections are additions not previously in the collection:—

Polypodium scouleri Hook. & Grev.
Adiantum pedatum L., var. *aleuticum Rupr.*
Sparganium minimum Fries.
Lilæa subulata H. & P.
Agropyron biflorum (Brign.) R. & S.
Agropyron inerme (S. & S.) Rydb.
Agropyron tenerum Vasey.
Agrostis hyemalis (Walt.) B.S.P.
Briza media L.
Calamagrostis langsdorfii (Link.) Trin.
Danthonia californica Bol.
Danthonia intermedia Vasey.
Echinochloa crusgalli (L.) Nash.
Festuca idahœnse Elmer.
Glyceria nervata Trin.
Hierochlœ odorata (L.) Wahlenb.
Kœleria cristata (L.) Pers.
Melica bella Piper.
Melica hartfordii Bol.
Melica subulata (Griseb.) Scrib.
Oryzopsis hymenoides R. & S.
Panicum occidentale Scrib.
Carex ænea Fernald.
Carex deweyana var. *bolanderi* Boot.
Carex exsiccata Bailey.
Carex feta Bailey.
Carex flava L.
Carex lasiocarpa Ehrh.
Carex leersii Willd.
Carex phæocephala Piper.
Carex preslii Steud.
Carex pyrenaica Wahl.
Carex sitchensis Bong.
Eleocharis obtusa (Willd.) Schultes.
Juncus mertensianus Bong.
Juncus oreganus Wats.
Juncus subtriflorus Coville.
Luzula piperi (Cov.).

Allium cernuum Roth., form *alba.*
Allium crenulatum Wiegand.
Asparagus officinalis L.
Disporum smithii (Hook.) Piper.
Erythronium grandiflorum Pursh.
Sisyrinchium segetum Bicknell.
Salix hookeriana Barr, var. *laurifolia.*
Salix mackenziana Barr.
Betula papyrifera Marsh.
Alnus oregana Nutt.
Alnus sitchensis (Regel.) Sarg.
Corylus rostrata Ait.
Eriogonum subalpinum Greene.
Polygonum douglasii Greene.
Polygonum nuttallii Small.
Arenaria verna L.
Montia chamissoi (Led.) Dur. & Jack.
Coptis asplenifolia Salisb.
Platystigma oreganum (Nutt.) Benth. & Hook.
Corydalis scouleri Hook.
Subularia aquatica L.
Athysanus pusillus Greene.
Thysanocarpus curvipes Hook.
Drosera anglica Huds.
Leptarrhena amplexifolia (Sternb.) Ser.
Mitella caulescens Nutt.
Parnassia fimbriata Banks.
Saxifraga delicatula Rydb.
Saxifraga emarginata Small.
Saxifraga saximontana E. Nels.
Ribes laxiflorum Pursh.
Aruncus sylvester Kost.
Sanguisorba microcephala Presl.
Spiræa menziesii Presl., form *alba.*
Lathyrus palustris L.
Trifolium arvense L.
Vicia cracca L.
Lythrum salicaria L.
Ludvigia palustris Ell.
Myriophyllum verticillatum L.
Sanicula septentrionalis Greene.
Hypopytes.
Hypopytes.
Newberrya congesta Torr.
Vaccinium sp. deliciosum Piper.
Dodecatheon puberulum (Nutt.) Piper.
Apocynum cannabinum L.
Gilia capitata Dougl.
Myosotis ? scorpioides L.
Prunella vulgaris L., form *alba.*
Prunella vulgaris var. lanceolata form *erubescens* Fernald.
Scutellaria lateriflora L.
Solanum nigrum L.
Chelone nemorosa Dougl.
Gratiola virginiana L.
Gratiola ebracteata Benth.
Orthocarpus castilleoides Benth.
Pedicularis ornithoryncha Benth.
Boschniakia strobiliacea Gray.
Plantago major var. *minimum* Dcne.
Galium trifidum L., var. *subbiflorum* Wieg.
Valerianella macrocera T. & G., a form.
Lobelia dortmanna L.
Madia glomerata Hook.
Petasites frigida (L.) Fries.
Senecio fastigiatus macounii (Greene.) Greenman.

A number of named and identified specimens of plants collected in Alaska and the islands of the Behring Sea have also been donated by Mr. J. M. Macoun, of Ottawa; these plants are a most valuable acquisition for reference and comparison with any collection made in the northern areas of this Province.

While the collection in the Herbarium is steadily growing, it is as yet far from representative of the flora of British Columbia; there are still several large areas of the Province not represented, and much new material may be looked for in the northern and north-eastern fields, and especially on portions of the mountain ranges on the west coast of Vancouver Island, where a number of plants known to occur on the Olympic Mountains, in Washington, and unknown to us, may appear.

The increase of introduced plants around our cities and railways is largely in evidence; many of these, being noxious weeds, can hardly be looked upon as a beneficial exchange for our native flora which is fast disappearing from these settled areas.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty,
1919.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1919

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
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1920.

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1920.

To Colonel the Honourable EDWARD GAWLER PRIOR,
A Member of the King's Privy Council for Canada,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Provincial Museum of Natural History for the year 1919.

J. D. MACLEAN,
Provincial Secretary.

Provincial Secretary's Office,
Victoria, February, 1920.

Provincial Museum of Natural History,
Victoria, B.C., February 24th, 1920.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1919, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

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PROVINCIAL MUSEUM REPORT

FOR THE YEAR 1919.

In making the Annual Report for the year it is deemed advisable to give as much as possible of the inception, history, and progress of the Institution.

A museum is an institution for the preservation of those objects which best illustrate Nature and the works of man; the use of these for the increase of knowledge and for the culture and enlightenment of the people; its special functions being to preserve and utilize objects of nature and works of art and industry. It supplies a need which is felt in every intelligent community, which cannot be supplied by any other agency; it does not exist, except among highly enlightened people, and attains its highest development only in great centres of civilization.

The growth of a museum from day to day may seem very small, but, if taken year by year, it shows what is accomplished with hard work and deep study.

It was on December 2nd, 1886, that the Provincial Museum was formally opened in a small room, 20 x 12 feet, in the old Government Building in the City of Victoria. The first Curator was the late John Fannin, who was informed that he would have to make the best of the accommodation until better quarters could be secured; in these quarters the first three years of the life of the Museum was spent.

On the removal of the Supreme Court to a new building, the Provincial Museum was moved into the old Supreme Court Building, and was formally opened to the public on May 24th, 1889, and the work of building up the institution was commenced in earnest. Gradually, but surely, the development of the Museum advanced until again the accommodation was totally inadequate. Then, again, when the present Legislative Buildings were erected, the east wing was allotted to the Provincial Museum, into which building the natural-history specimens were transferred in April, 1898, but the mineral exhibit, which had been part of the Provincial Museum up to this time, was transferred to the old Legislative Building for exhibition, and became part of the Department of Mines. The natural-history collections have now greatly outgrown the present building, which is used for exhibition purposes. All the valuable study series and a mass of material are stored in a wooden frame building at the rear, and cannot be exhibited on account of lack of exhibition space.

The collection is worthy of a large building, and is a credit not only to the Government, under whose direction it is managed, but to the people of the Province, whose individual efforts in the way of contributions have done so much to assist its growth.

The only financial support the institution receives is the annual vote granted by the Legislative Assembly, which is used as economically as possible, so as to get the best results.

It was not until February 21st, 1913, that an Act of Legislature was passed, endorsing the establishment of a Provincial Museum, making it statutory, defining its objects, and making regulations governing the working of the institution. The Department is under the control of the Honourable J. D. MacLean, M.D., C.M., Provincial Secretary and Minister of Education.

OBJECTS.

(*a.*) To secure and preserve specimens illustrating the natural history of the Province.

(*b.*) To collect anthropological material relating to the aboriginal races of the Province.

(*c.*) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and diffuse knowledge regarding the same.

ADMISSION.

The Provincial Museum is open, free, to the public daily throughout the year from 9 a.m. to 5 p.m. (except New Year's Day, Good Friday, and Christmas Day); it is also open on Sunday afternoons from 1 p.m. to 5 p.m. from May 1st until the end of October.

VISITORS.

The number of visitors to the Provincial Museum during the year 1919 has been a slight increase over that of 1918, over 40,000 having signed the visitors' register.

These figures are by no means accurate, as a great many people do not seem to like the idea of recording their names, and no record has been kept of the number of classes from the public schools of the city who, accompanied by their teachers, visited the Museum in connection with their nature-study. There have also been a number of specialists in several branches of natural sciences from some of the large museums of the continent who wished to examine the study series, which are stored in the annex, for which permission was gladly given by the Director.

It will be noticed, by referring to the first register that was kept by the Museum, in 1888, that only 500 people left their signatures. The number of visitors increased year by year until the year 1914, when, on the outbreak of the European war, the tourist travel to the West at that time received a considerable set-back. For about two years this seemed to affect the travel, but from then on, I am pleased to say, the visitors again began to increase not only throughout the summer seasons, but also a great many came from Alberta and Saskatchewan during our winter seasons on account of our milder climate.

ACTIVITIES.

As will be seen by the report in the several branches of natural history, no actual field parties were sent afield during the last summer, but this does not mean that the activities of the Museum were dormant, as considerable work has always to be done in connection with the Museum, in classification and identification of specimens from time to time, to make them more accessible to inspection and for study.

This work is carried on by a very small staff, all scientific work involving upon the Director and the Assistant Biologist, who are assisted by a few personal friends. The invaluable assistance afforded the institution by members of the large institutions of America, more particularly the staff of the Smithsonian Institution and the Biological Survey of the United States National Museum of Washington, D.C. (to whom a large number of specimens are sent for their specialists to identify and verify), cannot be too highly appreciated.

The specific identification of many of our small mammals is a difficult problem, owing to the lack of any large series from many localities, and not having the necessary appliances for the examination of cranial and dental characters, upon which determinations are greatly based.

In many instances it is also necessary to make comparison with type specimens, most of which are to be found in the largest institutions of America and Europe, and for this reason we have to rely greatly on the generosity and kindness of several well-known scientists.

ANTHROPOLOGY.

Very little material has been added to the anthropological collection this year, with the exception of several small specimens.

Mr. G. E. Darby, Medical Superintendent of the Bella Bella Hospital, donated to the Museum a piece of rope made of cedar-bark, which he states was found by an Indian, Moses Knight, who found a considerable quantity of it concealed in a cave on a small island near Bella Bella.

Miss Dorothy Matthews presented an Indian skull which she had found at Patricia Bay, North Saanich, in July, 1917. This skull is typical of the Indians of the Saanich Tribe of the Coast-Salaish Indians.

Mr. J. P. Babcock, the Deputy Commissioner of Fisheries, presented an Indian blanket made from the feet of the grey timber-wolves. This blanket was made by the Babine Indians at Babine Lake, B.C., which tribe of Indians belongs to Athapascan or Déné stock.

MAMMALS.

The Museum has received, through the efforts of Mr. H. W. Dodd, Government Agent at Telegraph Creek, a magnificent pair of locked caribou antlers in a perfect state of preservation. These antlers were found on Cariboo Mountain, West Cassiar, by Mr. W. Beach, of New York City, a big-game hunter, who was hunting at the headwaters of the Stikine in 1918. The battle which caused the death of these animals took place, no doubt, in the month of September, 1917, as traces of the velvet still remain on the antlers. The dimensions of the antlers are:—No. 1: Length of beam, 52 inches; spread, 44½ inches; points, 29 inches. No. 2: Length of beam, 51½ inches; spread, 32 inches; points, 29 inches. These two heads make a magnificent exhibit on the walls of the Museum.

Mr. E. W. Nelson, Chief of the Bureau of Biological Survey, United States Department of Agriculture, Washington, D.C., wrote asking for the loan of our study series of Ochotona, commonly called Little Chief Hare, as Mr. A. H. Howell, a specialist in their Department, was working on a revision of this genus, and wished to have specimens from every available portion of the country, so as to assist him in his classification and distribution of this interesting little mammal. Eighteen skins and skulls were loaned by this Department, which in due course were returned.

Bounties on Wolves.

According to the Orders in Council passed under the "Game Protection Act," all applications for bounties on wolves must be sent to the Director of the Provincial Museum for verification.

It is interesting to note that the Government, for the year 1919, was only called upon to pay the bounty on 100 timber-wolves, the bounty on which was $10 per head, but was increased by Order in Council to $15 on September 1st, 1919. It will be noticed that most of these applications have come from the Northern Coast and Northern Interior of the Province, very few applications for bounties being made south of the main line of the Canadian Pacific Railway, and I have no record of any applications being made on a wolf that was killed on Vancouver Island during the year. Wolves must be getting very rare on Vancouver Island, as the price now offered in the fur market ranges from $25 to $40, plus the Government bounty of $15 per head. This makes the pelts quite valuable, and therefore these animals would not be passed up by any hunter or trapper.

Several coyotes have been turned in with the timber-wolves by persons making applications for bounty; these, however, have been identified as coyotes, and bounty refused, unless the pelts were turned in to the Government to receive the Government bounty, which is only $2 on this animal.

Distribution in British Columbia of some Families of the Order Rodentia.

Small Mammals.—Animal life is very generously represented in British Columbia, probably due to the varied climate, resulting from the variance of altitude within its borders and a wide range of physiographic conditions. The life-zones range through the Transition, Canadian, and Hudsonian to the Arctic-Alpine zones on the summits of the highest mountain ranges; the Upper Sonoran zone covering a small strip of country in the Southern Okanagan.

Under such conditions it is hardly to be wondered that many of the species overlap in their range of distribution and subspecies become numerous. When the biological research of this Province has been completed, where well-defined races are known to exist in these areas, no doubt many new phases of intergrading will be revealed in the intervening territory.

The series of small mammal-skins in the collection of the Provincial Museum numbers some 1,200 skins; a greater portion of these, however, belong to the order Rodentia, or rodents, and it is proposed here to give a short account of the distribution throughout the Province of some families belonging to this order.

Muridæ.

Genus *Peromyscus*.

This genus includes the so-called wood-mice, deer-mice, vesper-mice, or white-footed mice, and is by far the most numerous in species and subspecies of all our small rodents, and in some form or another inhabit almost every portion of North America.

From a large series of skins there might be an unlimited discussion of the variation in *Peromyscus*, and one would deduct from the study of groups of a long series from various localities that intergradation existed more widely than generally supposed; individual variation being greatest in specimens from localities between the ranges of two well-established forms. It would therefore appear certain, with such a wide and frequent distribution, perfect intergradation must take place between related forms of different faunal areas. Classification in such cases would depend largely upon a set standard, and on which side of the fence intergrading specimens belong must remain a matter of individual opinion.

In April, 1909, the Bureau of Biological Survey, United States Department of Agriculture, published a revision of the American genus *Peromyscus* by Mr. Wilfred H. Osgood. This work has made it possible, to a reasonable degree of certainty, to classify, at least geographically, the several species occurring throughout our range, represented by the following:—

Peromyscus maniculatus arcticus (Osgood). Geographically distributed through the interior of North-west Canada, from South-eastern Saskatchewan north along the Mackenzie River, west to the upper waters of the Yukon River, then south to Eastern Alberta, in the Canadian and Hudsonian zones.

The British Columbia specimens identified as this species were taken in the Cariboo and Telegraph Creek Districts.

Peromyscus maniculatus oreas (Bangs). Type locality, Mount Baker Range, B.C., A. C. Brooks, distributed through the Puget Sound region in the mountains and coast of Western Washington, north to Southern British Columbia, south to the Columbia River.

Peromyscus maniculatus keeni (Rhoads). A small white-footed mouse occurring on the Queen Charlotte Islands, the type of which is from Masset, Graham Island.

Peromyscus maniculatus macrorhinus (Rhoads). On the Coast of the Mainland of Northern British Columbia and Southern Alaska; type collected by the Rev. J. H. Keen at the North Pacific Salmon Cannery, mouth of the Skeena River.

Peromyscus maniculatus artemisiæ (Rhoads). Ranges through South-Central British Columbia, south through parts of Washington, Idaho, and Western Montana, in the Transition and Canadian zones; type from Ashcroft, B.C.

Peromyscus maniculatus saturatus (Bangs). Type locality, Saturna Island, Gulf of Georgia, B.C., to which it is entirely confined.

Peromyscus maniculatus austerus (Baird). Geographic distribution over the Coast region of Puget Sound, Washington, north to Southern British Columbia and including Vancouver Island.

Peromyscus sitkensis prevostensis (Osgood). So far only recorded from Prevost Island, Queen Charlotte Islands, and Forrester Island, Alaska.

Genus *Microtus*.

Voles, or meadow-mice, occur throughout the greater part of the Northern Hemisphere north of the Tropics, and both species and individuals reach their maximum abundance in the Canadian and Transition zones, a few species occurring to the north in the Hudsonian and Arctic zones, even in the barren grounds north to the Arctic Coast.

They adapt themselves to the most diversified conditions of environment, inhabiting all classes of ground, from dry arid regions to wet swamps, a few species being aquatic in their habits.

The following species are represented in the Province of British Columbia:—

Microtus drummondi (Aud. & Bach.) (Drummond's Vole). Geographically distributed from the Hudson Bay to the west slope of the Rocky Mountains, the type locality being in the vicinity of Jasper House, Alberta.

Microtus townsendi (Bachman) (Townsend Vole). Distributed through the low country west of the Cascades, from Port Moody, B.C., south to the Willamette Valley and to Yaquina Bay, Oregon, in the Transition zone.

Microtus tetramerus (Rhoads) (Vancouver Vole). The distribution of this vole, so far as known, is the southern end of Vancouver Island; type from Beacon Hill Park, Victoria, and described from the type, and seventeen specimens collected near type locality.

Microtus mordax (Merriam). Ranges from latitude 60, Rocky Mountains and outlying ranges, to Northern New Mexico; common in Canadian and Hudsonian zones; specimens recorded from Nelson, Sicamous, Hope, Shuswap, Glacier, Okanagan, and Bennett City.

Microtus serpens (Merriam). Distributed through the low country of Southern British Columbia and Northern Washington between the Cascade Mountains and Puget Sound.

Microtus nanus canescens (Bailey) (Gray Vole). East of the Cascades in Northern Washington and Southern British Columbia; specimens recorded from Okanagan, Vernon, and Ducks, B.C.

Genus *Neotoma.*

The wood-rats of this genus are confined to North America. The bushy-tailed wood-rats occurring in this Province were separated from the round-tailed species, as the genus *Teonoma*, by Gray in 1843; although this name has been regarded by most later authors as only of subgeneric rank.

The bushy-tailed wood-rats are confined chiefly to the boreal zones in the Sierra Nevada and Rocky Mountain regions, extending nearly to north latitude 60. They are chiefly found in the mountains, where they dwell and seek protection among the cliffs and caves, being expert climbers. Occasionally we hear of wood-rats in the vicinity of camps and farm-houses, where they appear to develop a fascination of kleptomania, and ludicrous are the stories told of missing knives, forks, spoons, clothing, and other articles too numerous to mention, carried away and added to the nest material. Four new species occur within our limits, none being known on Vancouver Island.

Neotoma cinerea (Ord) (Grey Bushy-tailed Rat). Distributed throughout the Rocky Mountain region in Southern British Columbia, Montana, Idaho, and several adjoining States.

Neotoma cinerea drummondi (Richardson) (Bushy-tailed Wood-rat). Throughout the Canadian zone in the Rocky Mountains of Eastern British Columbia and Western Alberta, north of the range of *N. cinerea.*

Neotoma cinerea saxamans (Osgood) (Osgood Bushy-tailed Wood-rat). Geographic distribution in Northern British Columbia, west of the Rocky Mountains, in the Canadian and Hudsonian zones; limits of range unknown.

Neotoma cinerea occidentalis (Cooper, M.C.) Baird (Western Bushy-tailed Wood-rat). From the Pacific Coast region of South-western British Columbia south to Northern California.

Leporidæ.

Genus *Lepus.*

With the exception of Vancouver Island and most of the smaller islands on the Pacific Coast, hares and rabbits are more or less distributed throughout a greater portion of British Columbia.

Until some ten years ago, when Mr. E. W. Nelson, of the Biological Survey, United States Department of Agriculture, made a revision of the rabbits of North America, very little was known of the number of species and their geographic races.

From an economic view, hares and rabbits of this genus, when numerous in agricultural areas, do considerable damage to gardens, crops, fruit-trees, and young plantations. A peculiarity also is that when they become very numerous an epidemic in the form of disease decimates them, until hardly any can be found, and this state continues for a few years, when for the next few years they again multiply very fast, and once more attain their zenith of abundance. This takes place about every seven years, and up to the present period the exact cause is little understood.

The following species are represented in the Province:—

Lepus campestris townsendi (Bachman) (Western White-tailed Jack-rabbit). It occurs in a narrow tract of land along the Okanagan Valley, terminating at Fairview, also in the Similkameen Valley for twenty miles north of the boundary.

Lepus americanus macfarlani (Merriam) (Mackenzie Varying Hare). Distributed through all the Yukon Territory, Western Mackenzie, and Northern British Columbia; its extreme northern limit coincides with that of the trees.

Lepus americanus columbiensis (Rhoads) (B.C. Snow-shoe Rabbit). Ranges through the Rocky Mountain region of South-eastern British Columbia (except the extreme south-eastern corner), and from Vernon, in the Okanagan, to Jasper House, Alberta.

Lepus washingtoni (Baird) (Washington Varying Hare). This hare occurs on the Coast from the Fraser River Valley to the western slope of the Cascade Mountains, at low altitude.

Lepus bairdi (Hayden) (Rocky Mountain Snow-shoe Rabbit). Distributed through the higher parts of the Rocky Mountains from Idaho south; a series of skins in the collection of the Provincial Museum from Cranbrook, B.C., collected by Mr. C. B. Garrett, are referred to in this species.

Lepus bairdi cascadensis (Nelson) (Cascade Mountain Snow-shoe Rabbit). Ranges from Hope, B.C., on the Fraser River, to the Okanagan, south on the east side of the Cascade Mountains into Washington.

Ochotonidæ.

Genus *Ochotona.*

The Pika, or Little Chief Hare, has the appearance of a miniature brown rabbit, although it represents an independent family, being neither a hare nor a rabbit. Its habitat is high up on the mountain ranges of the West, from near timber-line up to the line of perpetual snow.

They live among the caves and crevices of the rock-slides and are to be found sitting on the top of some prominent rock; at the least alarm they give a shrill call and disappear into their retreats, only to appear again to see if the intruder has gone away.

These little animals are very industrious, and work constantly through the day, gathering grass and various alpine plants, which are piled up (like miniature stacks of hay) among the rocks for their winter use.

The series of skins in the collection of the Provincial Museum are all from the Mainland of the Province, and have recently been identified by Mr. Howell, of the Biological Survey, United States Department of Agriculture, Washington, D.C.

So far as is known, there is no record of the genus occurring on Vancouver Island; although it is quite possible that biological research in our Alpine-Arctic zones may add this mammal to the fauna of Vancouver Island.

Species known to occur in British Columbia are as follows:—

Ochotona princeps princeps (Richards). Distributed throughout the Rocky Mountains in British Columbia, northward to the South Branch of the Mackenzie River.

Ochotona collaris (Nelson). This is a northern species found in the mountains from south of Fort Yukon, including Atlin District, Northern British Columbia. The two skins in the Museum collection from White Mountain, Moose Arm, Tagish Lake, Atlin, presented by the late F. H. Mobley, M.P.P., are identified as this species.

Ochotona cuppes (Bangs). Throughout the Gold Range, British Columbia. Type locality, Monishe Divide.

Ochotona fenisex. Distributed through the Okanagan and Tulameen, the data of skins in the Museum collection recording an altitude of from 3,500 to 4,000 feet.

Ochotona fenisex brooksi. Skins recorded from Sicamous to Mount McLean, Lillooet. A comparatively new subspecies ranging through the Cascades.

Ochotona minimus (Lord). Distribution in British Columbia near the boundary-line. Limits of range unknown. Type from Ptarmigan Hill, Cascade Range, B.C.

ORNITHOLOGY.

Birds.—In this branch considerable work has been carried on throughout the year with the study series, ten new specimen sectional storage-cases having been added. The collection has been considerably worked over and made more accessible for students, and at the present time we are installing another sixteen sectional cases to take care of the balance of the valuable study skins, which have been stored in boxes and were not very accessible to those persons who wished to consult our large bird-skin collection of the birds of this Province.

Since Mr. J. W. Gibson, the Director of Elementary Education, has inaugurated his nature-study in the public schools of this Province, considerable call has been made on the Museum, more particularly in the study of bird-life. Numbers of classes have been brought here by their teachers, and the Director and his assistants have given all the possible instruction to these young students in their study of ornithology. The Department has also loaned a number of skins to several of the school-teachers upon request, so that they should have them handy for instructions in their nature-study at different times during the school term.

This, however, is not very satisfactory, on account of breaking into the series that should not really be loaned out for this purpose. It would be a capital idea if the Department of Education would take up the matter of having small collections of mounted specimens under their own jurisdiction; these to be sent round from school to school throughout the Province in cities and towns and districts where there are no measures similar to the Natural History Museum in Victoria. This would assist the children greatly in their identification of species, and also give them an idea of what to look for in their rambles throughout the country.

Numbers of requests come from time to time from other museums for the loan of ornithological material for study by specialists who are working out the exact species and subspecies, that vary so in different portions of America, according to geographical conditions.

Mr. J. Grinnell, Director of the Museum of the University of California, wrote this year asking permission of the Provincial Museum to loan to Mr. Harry S. Swarth, ornithologist of their Department, our collection of bird-skins of the genus *Passerella* (fox-sparrows), as he is working on a monograph of this species and is very anxious to secure the specimens from this northern portion of the country. Twenty specimens of this genus were loaned for comparison and have been returned—namely, three *P. i. townsendi*, four *P. i. fuliginosa*, two *P. i. meruloides*, five *P. i. sinuosa*, and six *P. i. altivagans.*

OOLOGY.

During the year the Provincial Museum was very fortunate in having a magnificent collection of birds' eggs presented by Mr. W. F. Burton, of this city.

Mr. Burton is an enthusiastic student of bird-life and a careful collector. He has added a number of sets of eggs not heretofore represented in the Oological division in the Museum. It has been the request of the donor that these specimens be exhibited in a case and kept by themselves as the W. F. Burton collection.

LIST OF EGGS IN THE BURTON COLLECTION.

No. of Eggs in Set	Set with Nest.	Species.	Common Name.
2	...	*Gavia immer* (Brunnich)	Loon.
1	...	*Gavia stellata* (Pontoppidan)	Red-throated Loon.
1	...	*Lunda cirrhata* (Pallas)	Tufted Puffin.
1	...	*Cerorhinca monocerata* (Pallas)	Rhinoceros Auklet.
1	...	*Ptychoramphus aleuticus* (Pallas)	Cassin's Auklet.
1	...	*Æthia pusilla* (Pallas)	Least Auklet.
2	...	*Synthliboramphus antiquus* (Gmelin)	Ancient Murrelet.
3	...	*Cepphus columba* Pallas	Pigeon Guillemot.
4	...	*Uria troille californica* (H. Bryant)	California Murre.
2	...	*Rissa brevirostris* (Bruch)	Red-legged Kittiwake.
3	...	*Larus glaucescens* Naumann	Glacous-winged Gull.
3	...	*Larus atricilla* Linnæus	Laughing Gull.
3	...	*Sterna caspia* Pallas	Caspian Tern.
3	...	*Sterna hirundo* Linnæus	Common Tern.
1	...	*Diomedea albatrus* Pallas	Short-tailed Albatross.
1	...	*Fulmarus rodgersi* Cassin	Rodger's Fulmar.
1	...	*Puffinus tenuirostris* (Temminck)	Slender-billed Shearwater.
1	...	*Oceanodroma furcata* (Gmelin)	Forked-tailed Petrel.
1	...	*Oceanodroma leucorhoa* (Vieillot)	Leach's Petrel.
1	...	*Oceanodroma melania* (Bonaparte)	Black Petrel.
1	...	*Oceanodroma socorrœnsis* C. H. Townsend	Socorro Petrel.
3	...	*Phalacrocorax penicillatus* (Brandt)	Brandt's Cormorant.
4	...	*Phalacrocorax pelagicus robustus* Ridgway	Violet-green Cormorant.
3	...	*Pelecanus californicus* Ridgway	California Brown Pelican.
4	...	*Branta canadensis canadensis* Linnæus	Canada Goose.
4	...	*Botaurus lentiginosus* (Montague)	Bittern.
3	...	*Ardea herodias fannini* Chapman	Northwestern Coast Heron.
3	...	*Nycticorax nycticorax nævius* (Boddært)	Black-crowned Night Heron.
1	...	*Grus mexicana* (Muller)	Sandhill Crane.
8	Nest	*Rallus virginianus* Linnæus	Virginia Rail.
4	...	*Recurvirostra americana* Gmelin	Avocet.
2	Nest	*Gallinago delicata* (Ord)	Wilson's Snipe.
3	..	*Actitis macularia* (Linnæus)	Spotted Sandpiper.
4	..	*Numenius americanus* Bechstein	Long-billed Curlew.
4	..	*Oxyechus vociferus* (Linnæus)	Killdeer.
4	...	*Ægialitis semipalmata* (Bonaparte)	Semipalmated Plover.
11	Nest	*Lophortyx californica californica* (Shaw)	California Quail.
7	..	*Dendragapus obscurus fuliginosus* (Ridgway)	Sooty Grouse.
7	..	*Bonasa umbellus sabini* (Douglas)	Oregon Ruffed Grouse.
2	...	*Cathartes aura septentrionalis* Wied	Turkey Vulture.
2	...	*Elanoides forficatus* (Linnæus)	Swallow-tailed Kite.
5	...	*Accipiter velox* (Wilson)	Sharp-shinned Hawk.
3	...	*Buteo borealis calurus* Cassin	Western Red-tailed Hawk.
2	...	*Buteo lineatus elegans* Cassin	Red-bellied Hawk.

List of Eggs in the Burton Collection—*Continued.*

No. of Eggs in Set.	Set with Nest.	Species.	Common Name.
3	...	*Archibuteo lagopus sancti-johannis* (Gmelin) ...	Rough-legged Hawk.
2	...	*Aquila chrysaëtos* (Linnæus)	Golden Eagle.
2	...	*Haliæetus leucocephalus leucocephalus* (Linnæus)	Bald Eagle.
4	...	*Falco peregrinus pealei* Ridgway	Peale's Falcon.
5	...	*Falco sparverius sparverius* Linnæus	Sparrow Hawk.
3	...	*Pandion haliaëtus carolinensis* (Gmelin)	Osprey.
4	Nest	*Otus asio kennicotti* (Elliot)	Kennicott's Screech Owl.
3	...	*Bubo virginianus pacificus* Cassin	Pacific Horned Owl.
4	Nest	*Dryobates villosus harrisi* (Audubon)	Harris's Woodpecker.
7	,,	*Dryobates pubescens gairdneri* (Audubon)	Gairdner's Woodpecker.
5	,,	*Sphyrapicus ruber notkensis* (Suckow)	Northern Red-breasted Sapsucker.
4	,,	*Phlœotomus pileatus abieticola* (Bangs)	Northern Pileated Woodpecker.
6	,,	*Asyndesmus lewisi* Riley	Lewis's Woodpecker.
2	,,	*Calypte costæ* (Bourcier)	Costa's Hummingbird.
2	,,	*Selasphorus rufus* (Gmelin)	Rufus Hummingbird.
4	,,	*Nuttallornis borealis* (Swainson)	Olive-sided Flycatcher.
3	...	*Empidonax wrighti* Baird	Wright's Flycatcher.
5	Nest	*Cyanocitta stelleri stelleri* (Gmelin)	Steller's Jay.
4	,,	*Spinus pinus* (Wilson)	Pine Siskin.
4	,,	*Junco hyemalis oreganus* (J. K. Townsend)	Oregon Junco.
4	,,	*Passerella iliaca fuliginosa* Ridgway	Sooty Fox Sparrow.
4	,,	*Pipilo maculatus oregonus* Bell	Oregon Towhee.
4	,,	*Zamelodia melanocephala* (Swainson)	Black-headed Grosbeak.
4	,,	*Passerina amœna* (Say)	Lazuli Bunting.
4	,,	*Piranga ludoviciana* (Wilson)	Western Tanager.
4	,,	*Vireosylva gilva swainsoni* (Baird)	Western Warbling Vireo.
5	,,	*Lanivireo solitarius cassini* (Xantus)	Cassin's Vireo.
4	,,	*Vermivora celata lutescens* (Ridgway)	Lutescent Warbler.
4	,,	*Dendroica auduboni auduboni* (J. K. Townsend)	Audubon's Warbler.
4	,,	*Oporonis tolmiei* (J. K. Townsend)	Macgillivray's Warbler.
3	,,	*Wilsona pusilla pileolata* (Pallas)	Pileolated Warbler.
5	,,	*Cinclus mexicanus unicolor* Bonaparte	Dipper.
5	,,	*Thryomanes bewicki calophonus* Oberholser	Seattle Wren.
5	,,	*Nannus hiemalis pacificus* (Baird)	Western Winter Wren.
6	,,	*Certhia familiaris occidentalis* Ridgway	California Creeper.
7	,,	*Sitta canadensis* Linnæus	Red-breasted Nuthatch.
7	,,	*Sitta pygmæa pygmæa* Vigors	Pygmy Nuthatch.
8	,,	*Penthestes rufescens rufescens* (J. K. Townsend)	Chestnut-backed Chickadee.
5	,,	*Regulus satrapa olivaceus* Baird	Western Golden-crowned Kinglet.
5	,,	*Myadestes townsendi* (Audubon)	Townsend's Solitaire.
3	,,	*Hylocichla guttata guttata* (Pallas)	Alaska Hermit Thrush.
3	,,	*Hylocichla guttata sequoiensis* (Belding)	Sierra Hermit Thrush.
4	,,	*Ixoreus nœvius nœvius* (Gmelin)	Varied Thrush.
7	,,	*Sialia mexicana occidentalis* J. K. Townsend ...	Western Bluebird.

FISHES.

Early in February the Director sent a specimen of the broad-fin cod (*Zaniolepis latipinnis*) to Dr. C. H. Gilbert, Department of Zoology, Stanford University, California, for verification. It was a very peculiar fish with the tail lacking.

Later I received from Dr. Gilbert the following: "I have received your specimen sent for identification and return it to-day. It proves to be a mutilated specimen of *Zaniolepis latipinnis*. It seems a marvel that a fish, left apparently without means of locomotion, should be able to make its way in the world and to reach an adult condition as well nourished as this seems to be. I do not recall having seen a similar case in the course of my long experience of fishes."

This peculiar specimen was taken by one of Watson's seine-boats in Stamp Harbour, near Alberni, V.I., and was presented to the Museum by Mr. A. A. Rhoades.

Mr. A. L. Hager, general manager of the New England Fish Company, Vancouver, who has always shown great interest in having his employees look out for rare specimens for the Museum, and through whose efforts several species have been added to the Provincial Museum collection, wrote to the Director on February 11th, "that Mr. Walter White, for many years employed as a halibut-fisherman on the vessels of the New England Fish Company, and latterly as mate on the S.S. 'Kingsway,' brought to their office a rock weighing about 2½ lb. Mr. White states that he personally took this rock from the stomach of a halibut weighing about 60 lb. The S.S. 'Kingsway' was fishing off Bonilla Island at the time in about 35 fathoms of water. It occurred to us that you might like to receive and preserve this rock."

This rock was eventually sent to the Provincial Museum by Mr. Hager. Later I sent a copy of the letter, as requested by Mr. Hager, to Mr. Will F. Thompson, Assistant in charge of the Long Laboratory, California, for his information.

Mr. Thompson is a well-known fish expert on the halibut fishes, and has done considerable scientific research-work in the Northern British Columbia halibut waters. In reply, Mr. Thompson writes as follows:—

"Many thanks for your letter with the copy of the note on the rock swallowed by the halibut. It is perfectly possible. The halibut are famous eaters of small things, and they pick from the ground, rocks, etc., and all sorts of things, including sea-anemones, clam-siphons, etc., and in the process of doing so they frequently take in many things which are not intended to find a lodging in the stomach of fish. The famous stones which the cod takes in (as ballast) in storms are the results that follow too reckless eating on the part of the cod. The size of the stone, however, is a most surprising thing. It bears witness to the reckless habits of the halibut."

The Museum also received a specimen of a fish, donated by Mr. Harry Pidcock, Quathiaski Cove, B.C., which appears to me to be that of an immature alligator fish (*Podothecus acipenserinus*), but this has not been verified by an authority.

The Department also received a specimen of an immature pipe-fish (*Aulorhynchus flavidus*), presented by Mr. H. A. Cox, Esquimalt, B.C. A small species of fish (*Sebastodes* sp.?) was also presented by Mr. A. S. Grice on July 30th, 1919.

This specimen I have not fully identified, and it will have to be sent through to Dr. Gilbert, who has always shown a great interest and is willing to do any work in the identification of fishes for this Department.

BOTANY.

The whole collection in the Herbarium has been numbered consecutively, and all duplicates correspondingly numbered and catalogued. This will eliminate a great disadvantage in connection with any correspondence concerning any particular species.

The number of mounted specimens in the collection of flowering plants at the present time is approximately 6,000. For some time past there have been many requests for a Check-list of the Flora of Vancouver Island, and it was deemed by the Director desirable to prepare the same. This entailed a considerable amount of work in the research of the earliest records of botanical collectors on the Pacific Coast.

The manuscript for this work, which was compiled by Mr. W. R. Carter, has now been completed, and it is to be hoped that the Department will be able to have it in the press before long. This Check-list also includes the plants known to occur on the islands adjacent, together with the Queen Charlotte Group.

Through the kindness of several collectors, a small number of specimens have been added to the collection, and thanks must be extended to the following gentlemen for the same:—

Professor J. K. Henry, for a small series collected in the Sicamous and adjoining districts, including: *Mentzelia albicaulis* Dougl.; *Gilia pharnaceoides* Benth.; *Castillea lutescens* (Greenman) Rydb.; *Utricularia intermedia* Hayne; *Chænactis Douglasii* H. & A.; *Botrychium lunaria* (L.) Sw.; and *Lotus corniculatus* L. from Elgin, B.C.

Dr. C. F. Newcombe, for several rare specimens from the southern portion of Vancouver Island: *Tissa macrotheca* (Hornem) Britt.; *Ranunculus Lobbii* Gray; *Hosackia gracilis* Benth.; *Limnanthes Macounii* Trelease; also for access to his valuable botanical library in research of data difficult to obtain.

Mr. J. R. Anderson, for a large collection of plants, a few of which have made appreciable additions to the Herbarium, especially *Abronia acutalata* Standley and *Achillea californica* Poll., the latter a new record for Vancouver Island.

Among this collection were a number of specimens collected by his brother, Mr. W. B. Anderson, in various portions of the Province, which include: *Beckmannia cruceæformis* (L.) Host.; *Chenopodium urbicum* L.; *Thelypodium integrifolium* (Nutt.) Endl.; *Gilia Hookeri*

Benth.; *Lupinus ornatus* Dougl.; *Pentstemon ovatus* Dougl.; *Anogra pallida* (Lindl.) Britt.; *Sphæralcea munroana* (Dougl.) Spach.; and *Tetradymia canescens* DC.

During the last summer a collection of plants was donated to the Museum by the authorities of the Mount Tolmie University School. This collection had belonged to the late Captain R. V. Harvey, who was one of the founders of the school. These plants, while mounted on small-size sheets, and in most instances showing little more than the inflorescence, can hardly be looked upon as Herbarium specimens.

Professor J. Macoun, senior Botanist of the Geological Survey of Canada, who has always taken a great interest in the Provincial Herbarium, and several years ago added to our collection over 900 named and classified specimens, mostly of the flora of Vancouver Island, has continued his great support to this division, and has made an offer to the Provincial Museum, subject to the approval of Mr. R. G. McConnell, Deputy Minister of Geological Survey, Ottawa, of a collection of Cryptogammes upon which he has been working and classifying for a considerable time.

The idea is for the Provincial Museum to take over for the time being the whole of his collection, with the understanding that a division be made on some future date (as there are a number of duplicates of each species) between this Department and the Department at Ottawa.

Both Professor Macoun and J. M. Macoun, C.M.G., Chief of the Biological Division of the Department of Mines, Ottawa, have always shown a great interest in the Provincial Museum, and have done a great deal of work, more particularly in the Botanical section, in the identification of plants from every section of this Province.

Mr. J. M. Macoun has also been filling in blanks in our collection from time to time from the Ottawa collection and from a number of plants that both he and his revered father have collected throughout British Columbia in their botanical survey of Canada. The Provincial Museum has at different times sent many specimens (of which a number at present are still there) to Ottawa to be verified by Mr. Macoun. These specimens, it is to be hoped, will be returned in due course.

In Memoriam.

Mr. J. M. Macoun, C.M.G., Chief of the Biological Survey Department, Ottawa, died on January 8th, 1920. The late Mr. Macoun was one of the highest authorities on botanical research in Canada. He was a faithful and courageous public servant and a man of high standing in scientific research. His loss will be keenly felt not only by the Department with which he had been so long connected, but also by the Provincial Museum in Victoria, to which he was a constant visitor when on the Pacific Coast.

ENTOMOLOGY.

The Museum collection during the year has been greatly enriched by the donation of the valuable collection of the late Captain R. V. Harvey, which was donated by the authorities of the Mount Tolmie University School. This collection is especially rich in Diptera, of which the late Captain Harvey was a recognized authority in British Columbia.

The Coleoptera and Hymenoptera collections are also particularly acceptable, and, as they are representative of the whole of Southern British Columbia, they will enable us to enlarge and extend our own collections in these orders. Provision is being made for the incorporation of these collections with those already existing in the Museum, and when finally installed they will prove of incalculable value to students.

The thanks of the Department are due to Mr. E. H. Blackmore, President of the British Columbia Entomological Society, for his valuable services, which were instrumental in securing this highly desirable collection for this institution.

Mr. Blackmore has always done considerable work in the Entomological division of this Department, both in identification and arranging the collection for study and inspection, and he has also written the following paper on entomology.

ENTOMOLOGY.

By E. H. Blackmore, F.E.S.

Practically no entomological field-work of any description was undertaken by any of the Museum staff during the past season, and therefore there is not so much as usual to write about in connection with the actual work of the Museum. I have, however, been able to gather a few

PLATE I.

LYCAENIDÆ, HESPERIIDÆ, AND ARCTIIDÆ.

Plebeius icarioides blackmorei B. & McD.
(Male paratype.)
Goldstream, B.C. (E. H. Blackmore).
(New to science.)

Plebeius icarioides blackmorei B. & McD.
(Female paratype.)
Goldstream, B.C. (E. H. Blackmore).
(New to science.)

Plebeius icarioides blackmorei B. & McD.
(Under-side male.)
Goldstream, B.C. (E. H. Blackmore).

Plebeius icarioides pembina Edw.
(Under-side male.)
Rossland, B.C. (W. H. Danby).

Heodes cupreus Edw.
Lillooet, B.C. (A. W. A. Phair).
(New to British Columbia.)

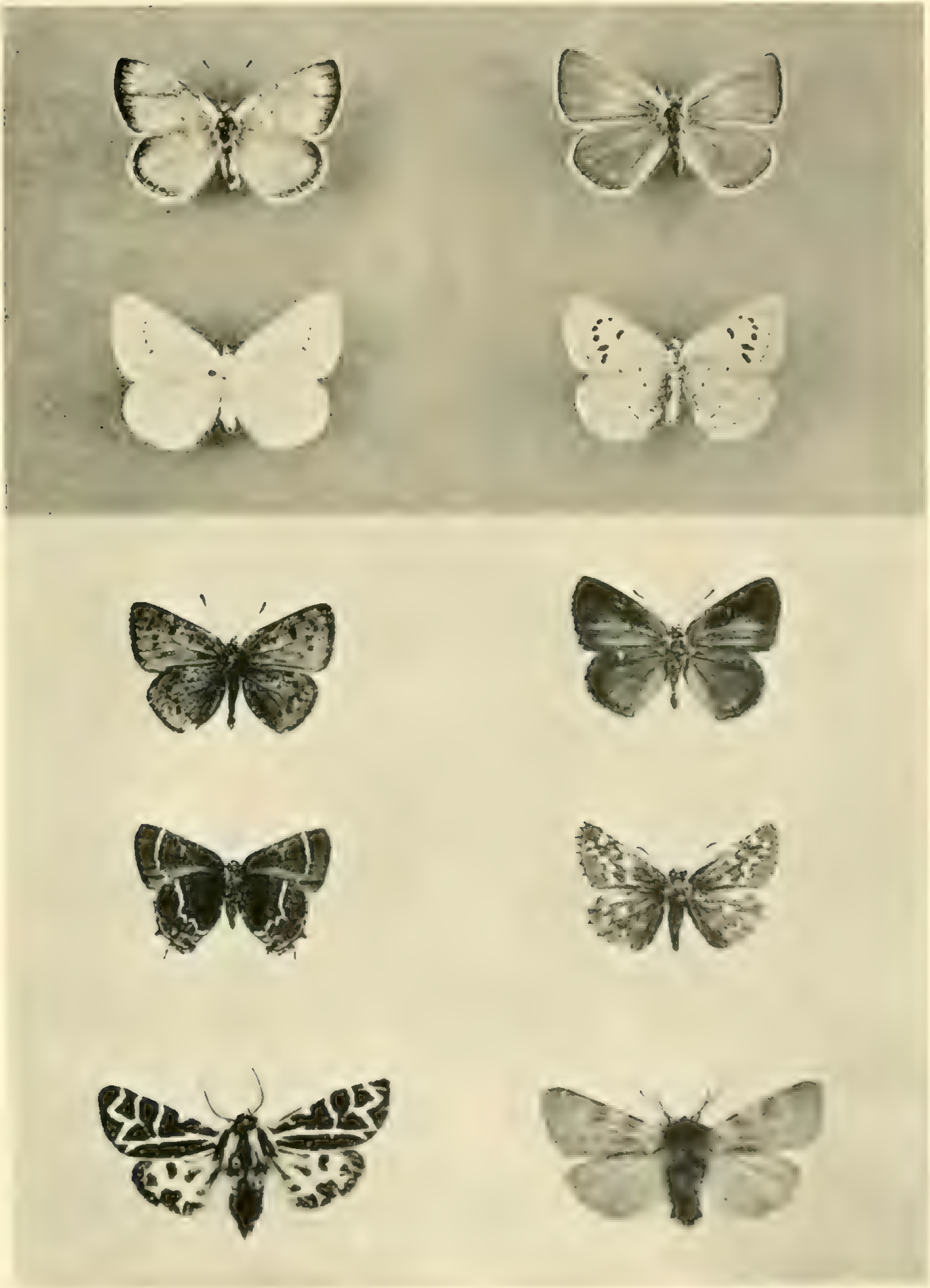
Callipsyche behri Edw.
Osoyoos, B.C. (W. B. Anderson).
(Very local.)

Mitoura spinetorum Bdv.
Fairview, B.C. (W. B. Anderson).
(Very rare.)

Hesperia centaureæ Ramb.
Atlin, B.C. (E. M. Anderson).
(New to British Columbia.)

Apantesis blakei diecki Neum.
Lillooet, B.C. (A. W. A. Phair).
(New to British Columbia.)

Neoarctia beani Neum.
Kaslo, B.C. (J. W. Cockle).
(New to British Columbia.)



interesting facts from other workers in the Province; a little more previously undetermined material has been worked over; and these, together with some of my own captures, will enable us to present a fairly comprehensive account of the work done in the Province in this particular branch of science during the year 1919.

In last year's report mention was made of the remarkable scarcity of noctuids during that year, but this past season was far worse. In fact, this scarcity extended to all orders of insects, and was not confined to any particular district, but was noticeable in every section of the Province. There is no reasonable explanation that can be given of this sudden diminution of numbers, and even of species.

As usual, there were a few exceptions to the general rule, one of them being our old friend (?) the forest tent-caterpillar (*Malacosoma pluvialis* Dyar). The larvæ of this moth were particularly numerous in the early spring, even worse than the year previous, but fortunately before they became "full-fed" they were attacked by a disease—of a fungoid or bacterial origin—which killed them off in thousands.

In the south-eastern part of the Province, especially along the border, a great deal of damage was done by several species of locusts—one of the worst invasions we have had for many years. Mr. E. R. Buckle, of the Provincial Department of Agriculture, has been working in the infected area during the season, studying the conditions and using remedial measures with a view to preventing the occurrence of a further outbreak.

In the Report of the Provincial Museum, 1918, on page 12, is a note on the occurrence of *Hemerocampa vetusta gulosa* at Chase, B.C., in which the writer stated that the insect was double-brooded. This I find is not the case, as in a subsequent letter from Mr. R. C. Treherne, Dominion Field Officer for British Columbia, he remarks that from the data in his possession he is quite satisfied that this destructive insect is only single-brooded. It is interesting to note in this connection that Mr. W. B. Anderson found a slight outbreak at Armstrong during the past year in addition to the one reported from Chase the year previously, which latter had spread much farther than when first noted.

RARE AND UNCOMMON INSECTS TAKEN IN BRITISH COLUMBIA DURING 1919.

Owing to the dearth of insects in the Province during the past season, it would be only reasonable to suppose that this section of our report would be smaller than usual; nevertheless, quite a few items have been reported which are of more than passing interest.

Victoria.—In late May two worn specimens of that rather rare Sphingidæ, *Proserpinus clarkiæ* Bdv., were taken at rest on a peach-tree at Swan Lake. A very fine specimen of *Polia variolata* Sm. was taken by Mr. W. R. Carter on July 11th; this capture is exceedingly interesting in view of the facts set forth in last year's Museum Report, wherein this species was figured. The same collector also took a nice specimen of *Ipimorpha nanaimo* Barnes, to which, curiously enough, the same remarks apply.

In addition to the specimen of *Cucullia omissa* Dod, which is figured on Plate II., another specimen was taken in the Hollywood District by David Livingstone, a young and enthusiastic collector, who has kindly donated it to the Museum collection.

A male specimen of *Erebus odora* Linn. was captured the first week in October by Mr. W. R. Nairnes, of this city. It was taken about 4 o'clock in the afternoon of an exceedingly windy day, and at first sight Mr. Nairnes thought it was a large leaf being blown about. This is the first capture of this Florida "migrant" we have heard of for several years.

Goldstream.—The writer spent a few hours at the Goldstream Flats on July 20th, and amongst other interesting material obtained was a short series of *Epirrhœ alternata* Mull., a pair of *Dysstroma occidentata* Tayl., and a single specimen of *Stamnodes blackmorei* Swett.

Fitzgerald.—This station is situated about eleven miles north of Goldstream and is in the midst of a mountainous district. Mr. W. R. Carter, of the Museum staff, spent many week-ends in the locality and obtained many desirable species. Amongst the Diurnals several specimens were taken of both sexes of that rather uncommon little skipper, *Euphyes vestris* Bdv. The most interesting noctuids were *Euxoa ochrogaster gularis* Grt.; *Feltia herilis* Grt.; *Zosteropoda hirtipes* Grt.; *Septis multicolor* Dyar; and *S. plutonia* Grt. Amongst the geometers the following were of special interest: *Cosymbia lumenaria* Hbn.; *Diactinia silaceata albolineata* Pack.; *Eupithecia cretaceata* Pack.; *Drepanulatrix fœminaria* Gn.; and *Sericosema juturnaria* Gn. We are glad to have this last record, as very few specimens have been taken on Vancouver

Island, and this is the most southerly point yet recorded. Mr. A. W. Hanham, in a recent letter, tells me that he has a specimen given him by the late Rev. G. W. Taylor, labelled Cameron Lake, July 23rd, 1903, and Mr. G. O. Day writes me that he took one specimen at Cowichan Bay, July 7th, 1915. The date of the Fitzgerald specimen is June 15th. On the Mainland, anywhere from Lillooet to the Kootenays, this particular geometer is very abundant, some years being a perfect nuisance.

Maillardville.—This small settlement is about a mile from Fraser Mills and some five miles from New Westminster. Mr. L. E. Marmont, the Reeve of the district and an old-time entomologist, has taken some very interesting species there. The most desirable of the Noctuidæ are *Rynachgrotis gilvipennis* Grt.; *Trachea impulsa* Gn.; and *Bomolocha palparia* Wlk. (uncommon).

Mention must be made of two remarkable aberrations; one of *Namagana prœacuta* Sm. is a peculiar melanic form, the ground colour of the primaries being of a dark sooty brown, with the orbicular, reniform, and s.t. line of a light-ash colour and standing out in startling relief. The other one is *Zale minera norda* Sm., and in place of the usual mottled appearance, with its abundance of fine wavy lines, the whole of the wings are light brown, being only relieved by a wide black t.p. line, black discal mark, and black basal area. Amongst the geometers taken, *Philobia ulsterata* Pears. in very uncommon, and we were glad to get the record of *Caripeta æqualiaria* Grt., taken on May 17th. This latter seems to be exceedingly rare, as we have very few records of its capture.

Lillooet.—During the first week in July Messrs. Day & Hanham, of Duncan, made a collecting-trip to Lillooet, and, although owing to the poor season the general result was rather disappointing, a few good specimens were taken, especially in the Geometridæ. Amongst some of the latter submitted to us for identification we noted the following: *Drepanulatrix unicalcararia* Gne. and its form *cervinicolor* Hlst.; *D. fœminaria* Gne.; and *D. carnearia* Hulst. The latter is an exceedingly good capture and is the first male and the third record we have from the Province, the other two being a female from Kaslo and another female from Ymir.

A single specimen was taken of *Dysstroma formosa* Hulst. This is the first record we have had of this for three years, Mr. A. W. Phair having taken a single specimen at the same place on June 23rd, 1916.

On looking over some material recently sent by Mr. Phair, we found a nice specimen of *Smerinthus cerisyi opthalmicus* form *pallidulus* Edw., taken on August 16th, 1919. This is the latest date we have of this form, although Mr. Cockle reports one taken at Kaslo on August 9th, 1901. Amongst the Noctuidæ, *Rynchagrotis vittifrons* Grt. and *cerapoda oblita* Grt. are the best. Up to the present we have no record of either of these species being taken in any other locality.

Spences Bridge.—Mr. W. A. Newcombe, who is connected with the Provincial Department of Fisheries, spent the latter part of August in this district, and in his spare time collected a little material, some of which was very desirable, noticeably *Euxoa costata idahœnsis* Grt.; *Rhizagrotis flavicollis* Sm.; and *Lycophotia nigra* Sm. The latter name has been used in many British Columbia collections for a somewhat similar species—*L. astricta subjugata* Dyar. The only other authentic records of *nigra* that we have besides this are from Armstrong, Rossland, and Kaslo. Only one geometer was taken, *Itame matilda* Dyar.

Quesnel Dam.—During September Mr. Newcombe spent a few weeks in this locality, but as the season was getting late nothing much was taken; however, we are always pleased to get material from here, as very little collecting has been done in this district. *Polygonia satyrus* Edw., *P. faunus rusticus* Edw., *Aglais j-album* Bdv. and Le C., were the only Diurnals taken. A short series of *Agrotis inopinatus* Sm. was captured, the only noctuid observed. Geometers were also scarce, three specimens of Dysstroma being all that were seen. Two of these belong to the *citrata* group, the other one being *D. formosa boreata* Tayl., which is a very rare form and one that we are pleased to receive.

Osoyoos.—In addition to the Diurnals mentioned under the heading of "Illustrated Lepidoptera," Mr. W. B. Anderson succeeded in getting a few specimens of *Marmopteryx marmorata* Pack. This is an exceedingly pretty geometer on the under-side, the marbled effect being especially striking. The first specimens we saw of this species were a pair collected by Mr. E. M. Anderson on May 7th, 1913, at Vaseaux Lake, just south of Penticton.

Fort Steele.—Mr. W. B. Anderson took the first specimen of *Euptoieta claudia* Cram. recorded from British Columbia on September 23rd, 1919. This is a most interesting record, and we are glad that Mr. Anderson, who is a most indefatigable worker, has added this to our list of

British Columbia butterflies. It belongs to the family Nymphalidæ and is closely allied to the genus *Argynnis*. It has a wide distribution throughout the United States and South America, being essentially a southern insect.

NEW BRITISH COLUMBIA INSECTS.

The following ten insects have been described as new to science during the year 1919, and comprise seven species of Lepidoptera, two species of Diptera, and one of Thysanoptera.

Lepidoptera.

Plebeius icarioides blackmorei Barnes & McDunnough is described in the Can. Ent., Vol. 51, p. 92, April, 1919, from a number of specimens taken by the writer at Goldstream on May 31st, 1918. More extended remarks on this new race will be found under the heading of "Illustrated Lepidoptera."

In the Journal New York Ent. Socy., Vol. XXVII., Nos. 2 and 3, June and September, 1919, Dr. R. Ottolengui describes several new species and races of the genus *Autographa* (Noctuidæ), amongst which are two from British Columbia. *Autographa magnifica* described from a single female taken at Ucluelet, on the west coast of Vancouver Island. It was taken by a member of the Forestry Branch of the Dominion Department of Agriculture. The type is in the Canadian National Museum at Ottawa.

The other is *Autographa rectangula nargenta* and was described from material belonging to Mr. J. W. Cockle, of Kaslo, B.C., and Mr. A. W. Hanham, of Duncan, B.C. This is the *rectangula* of our check-lists, which is really an Eastern species.

The chief distinguishing characteristic of this new race is the transverse posterior line, which is distinct and geminate, the space between being filled with silver.

In the Lepidopterist, Vol. 3, No. 2, p. 105 *et seq.*, July 15th, 1919, Messrs. Swett & Cassino describe four species of geometers belonging to the genus *Eupithecia*. Two of these are from British Columbia, viz.: (1) *Eupithecia probata*, described from specimens taken at Duncan and Victoria, and (2) *Eupithecia moirata*, taken by E. M. Anderson at Penticton in 1913. Both these new species will be treated of more fully under the same heading as the preceding.

Microlepidoptera.

In the Proc. Ent. Socy. Wash., Vol. 21, No. 3, March, 1919, under the title of "Two Microlepidoptera injurious to Strawberry," Mr. August Busck describes two new "Micros" from specimens taken by Mr. W. Downes, Dominion Junior Entomologist at Victoria, B.C. The first is *Tortricodes fragariana*, and, according to the author, is the first published record of this genus in North America. Mr. Downes says that this species breeds commonly in the buds at the head of the crowns of strawberry.

The second is *Aristotelia fragariæ*, and, according to Mr. Busck, is the so-called "strawberry-crown borer," on which there is considerable economic literature, but which had not previously received a specific name. The first species belongs to the family Tortricidæ and has the fore wings brownish fuscous in colour, overlaid with black and reddish scales; the hind wings are much lighter, being a silvery grey. It is a small moth measuring 17 mm. in alar expanse. The second species, *Aristotelia fragariæ*, is a member of the family Gelechiidæ and is a much smaller insect, being only 12 mm. in width when spread. In colour it is dark brown, with the hind wings lighter.

Diptera.

In an article on "The Streptocera Group of the Dipterous Genus Tipula Linn," Annals Ent. Socy Amer., Vol. 12, No. 2, p. 84, June, 1919, Dr. W. G. Dietz describes some half-dozen new species, one of which is recorded from Victoria, B.C., under the name of *Tipula trypetophora*. It is described from nine specimens, two males and seven females, all from Victoria, and apparently on the same date, July 6th, 1912, but who the captor was is not stated. This is one of the crane-flies.

Mr. Jas. S. Hine, in an exhaustive review of the "Robber-flies of the Genus Erax" (*idem*, p. 103), describes quite a number of new species in the various groups of this genus.

One amongst them is particularly interesting to us, as the two specimens from which they were described were taken by the late Captain R. V. Harvey at Vernon in August, 1904. The species, which belongs to "The Aridus Group," has been named by Mr. Hine *Erax harveyi* in honour of its collector.

Thysanoptera.

In a very interesting article on "Western Thysanoptera" by R. C. Treherne, Dominion Assistant Entomologist for British Columbia, in Can. Ent., Vol. 51, p. 181, August, 1919, a new species of Thrips is described from this Province under the name of *Ælothrips auricestus.* The type material consists of nine macropterous females taken by the author from the western wild rye-grass (*Elymus condensatus*) at Vernon and Kelowna in July, 1917. The author of the above article is to be congratulated for the able and painstaking manner in which he has collected and presented the known facts, augmented with his own observations, of the different species belonging to this order occurring in British Columbia, some of which are of great economic importance. The paper is illustrated with two plates, which add greatly to its usefulness.

Illustrated Lepidoptera.

In continuation of the idea expressed last year, of describing more fully the insects illustrated in the Annual Report, we are acting in accord with the declared wishes of the active entomologists of this Province, as the commendatory letters we have received during the past year fully testify. As stated in last year's Annual Report, the numbers appearing before each name correspond with a similar number in Messrs. Barnes & McDunnough's Check-list of North American Lepidoptera, February, 1917. Those with a star prefixed to them have been described during the year 1918.

Diurnals (Plate. I.).

372. *Mitoura spinetorum* Bdv. This is one of our butterflies which appears to be more or less local. Until quite recently only two or three specimens had been taken in the Province—two, I believe, at Fairview and one at Kaslo. In a recent letter, Mr. J. W. Cockle, of the latter place, remarks that he has taken a second specimen. Mr. Walter B. Anderson, Dominion Inspector of Indian Orchards, while on a trip in the Boundary country early last June, took a short series at Fairview and a few days later took two more at Penticton. It is an easily recognized insect, as on the upper side it is nearly black in colour, with the basal half of the wings shot with bluish-green. The under-side is reddish-brown, with the contrasting white lines which is characteristic of this subfamily. A figure is given of the under-side, showing the arrangement of the lines, which differ somewhat from its close ally, *Mitoura nelsoni*, which occurs on Vancouver Island and the Lower Fraser Valley.

394. *Callipsyche behri* Edw. is apparently more local than the preceding one, and so far has only been taken in one district in the Province—namely, the Osoyoos District. There is a strip of land extending from the boundary-line to Penticton (and including Osoyoos, Fairview, Dog Lake, and Vaseaux Lake) which is the extreme tip of the Upper Sonoran fauna, and many insects are taken in this district which do not occur in any other part of the Province.

It is rather a pretty butterfly, its colour on the upper side being a bright fulvous, with wide black-brown marginal bands. The specimen figured was taken by Mr. Anderson at Osoyoos in the first week in June. It is an inhabitant of Northern California and Oregon, extending eastward to Colorado.

411. *Heodes cupreus* Edw. Passing mention was made of this beautiful butterfly in the Report of the Provincial Museum, 1917, page 13. It was only recently that we were able to secure a good specimen for photographic purposes, and we are glad to illustrate this species, as it is entirely new to British Columbia, and, as far as the writer knows, has only been taken on Mount McLean, near Lillooet, at an altitude of between 7,000 and 8,000 feet. It was taken by Mr. A. W. A. Phair, an enthusiastic collector of Lillooet, who has done much to extend and enlarge our knowledge of the fauna of that district. It is a gorgeous little butterfly, being a bright coppery red, spotted with black. It is exceedingly rare, and previous to 1892 had been recorded from two localities only—namely, Mount Shasta, California, and Oregon. In that year Mr. W. G. Wright took three or four specimens at a high altitude in the Sierra Nevadas of California. It is closely allied to *Heodes snowi* Edw., which is duller in colour and not so heavily spotted. This latter is taken at Laggan, Alberta, in the Canadian Rockies, and also in the high mountain ranges of Colorado. We also have a specimen of this species in the Museum collection, taken at "Boom Pass"; this locality being a local name cannot definitely be placed, but is probably in the vicinity of Revelstoke.

PLATE II.
NOCTUIDÆ AND GEOMETRIDÆ.

Cucullia omissa Dod.
Victoria, B.C. (E. H. Blackmore).
(New to Vancouver Island.)

Cucullia florea Gue.
Rossland, B.C. (W. H. Danby).
(New to British Columbia.)

Stretchia plusiæformis Hy. Edw.
Rossland, B.C. (W. H. Danby).

Stretchia muricina Grt.
Victoria, B.C., (E. H. Blackmore).

Cerma cuerva Barnes.
Victoria, B.C. (E. H. Blackmore).
(Very rare.)

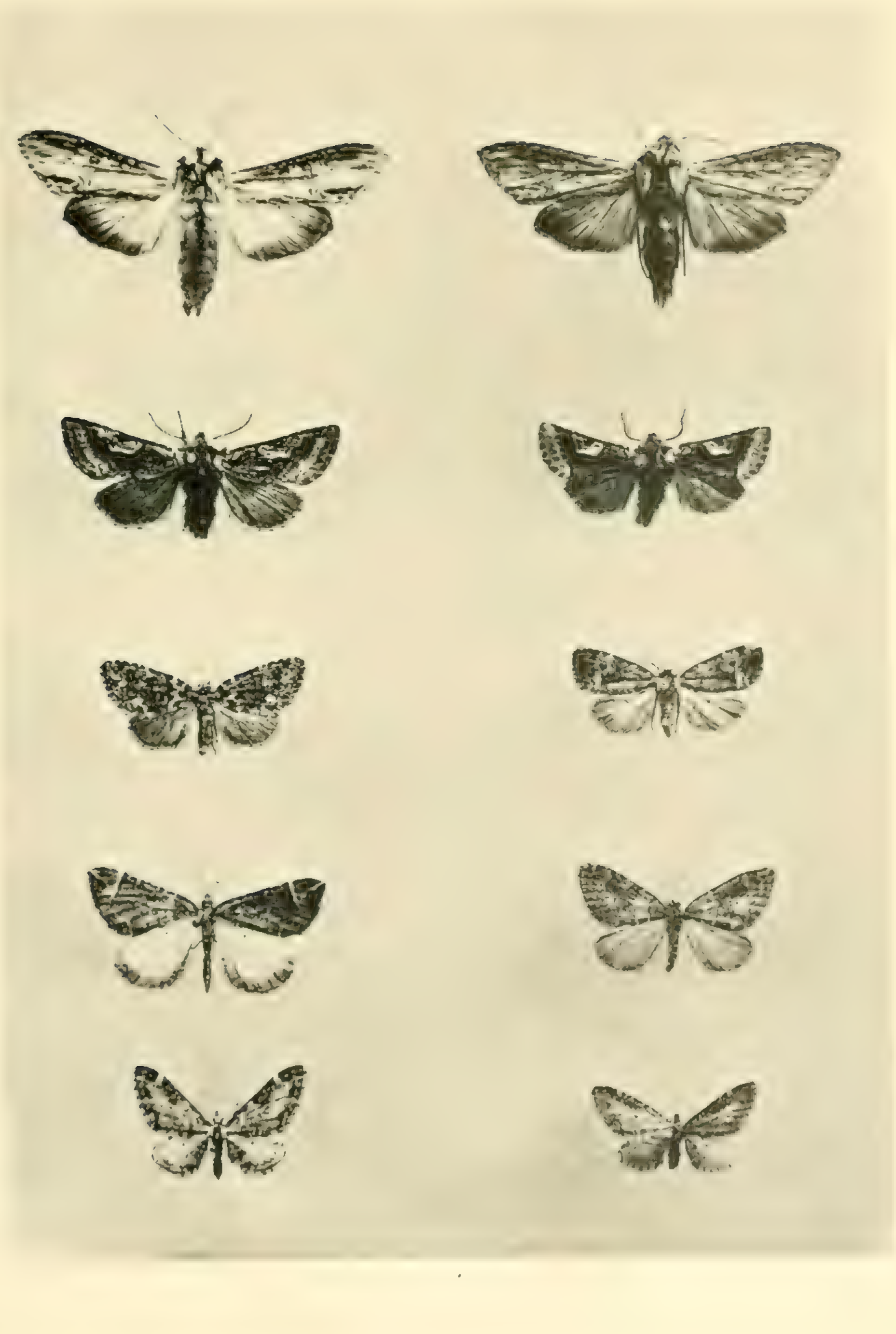
Monodes festivoides Gue.
Lillooet, B.C. (G. O. Day).
(Very rare.)

Lygris testata Linn
Quesnel Dam, B.C. (W. A. Newcombe).
(New to British Columbia.)

Thera otisi Dyar.
Kaslo, B.C. (J. W. Cockle).
(Very rare.)

Eupithecia probata Swett & Cassino.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Eupithecia moirata Swett & Cassino.
Penticton, B.C. (E. M. Anderson).
(New to science.)



Plebeius icarioides blackmorei B. & McD. This new race was described by Messrs. Barnes & McDunnough in the *Canadian Entomologist*, April, 1919, page 92, from twenty-six specimens of both sexes sent to them by the writer, and taken at Goldstream on May 31st, 1918. In June, 1916, I captured about six specimens, mostly females, on a small hill some 700 or 800 feet high about three miles south of Goldstream; they were new to me, but later I found a pair in the Museum collection under the name of *Cupido pheres* and three specimens in the collection of Mr. A. J. Croker under the name *Cupido icarioides*. Upon further comparison I found that they were all conspecific and sent them to Messrs. Barnes & McDunnough for their opinion. Dr. McDunnough stated in his reply that it might prove a good geographical race, but would need a good series of both sexes to make sure. In June, 1917, I was collecting in the Lower Fraser Valley, and was therefore unable to be at Goldstream at the time of their emergence. The last two weeks of May, 1918, were extremely windy, and after waiting a whole week in vain for the wind to abate I decided to chance it, and in company with Mr. Arthur Robinson, of this city, went to Goldstream. Upon our arrival there the wind was blowing as furiously as ever, and the chances of capturing our prized "blue" seemed very remote. However, as we had come so far, we decided to walk the remaining three miles to the hill where I had taken them two years before. On the top of this elevation is an area of about an acre in extent, totally devoid of trees, and covered with blue lupines (*Lupinus columbianus* Heller), on which plant the larvæ of this butterfly feed. Upon reaching this spot the wind was still blowing hard, and the lupines were bent over at an angle of 45 degrees; the outlook was very discouraging, as we had had a long walk, and naturally there was nothing flying in such a wind. After being there a few minutes I noticed a "blue" butterfly hanging on for dear life to the stalk of a lupine that was swaying violently in the wind, and to my great delight it was the one we were looking for. We then commenced a diligent search, and in the course of an hour and a half "bottled" over forty specimens. This spot seems to be the headquarters of this species, as, although I have taken it in two other places in the general vicinity, it has only been very sparingly. On the Malahat, some eight miles north of Goldstream, on the side of a small mountain of some 1,200 feet elevation, there were acres and acres of this blue lupine, over which "blue" butterflies were swarming, and out of over a hundred that were captured only six proved to be this species. *Cupido pheres*, under which name this insect has gone for a number of years, is only known from the San Francisco Bay region and typical *icarioides* from the mountains of California.

433e. *Plebeius icarioides pembina* Edw. This is another of our blues that has been misidentified in British Columbia collections for many years, it having passed under the name of *fulla* in the 1904 Check-list, and under the name of *ardea* in Check-list issued in 1906. *Ardea* is now regarded as a race of *icarioides* from the Great Basin region (*vide* Cont. Lepid. No. Amer., Barnes & McDunnough, Vol. III., No. 2, page 114).

Arctiidæ (Plate I.).

946. *Neoarctea beani* Neu. This species is a new record for British Columbia, and was taken at "light" by Mr. J. W. Cockle at Kaslo on August 20th, 1919. This is one of the most interesting finds of recent years, as, although it was described over twenty-eight years ago (Can. Ent., Vol. 23, p. 123, June, 1891), I believe that this is the second specimen taken in the adult state. It was originally described from Laggan, Alberta, where Mr. T. E. Bean bred several specimens from estray larvæ which he had picked up in a full-fed state. During the four years that Mr. Bean spent in that district he only took one adult specimen, a male, on July 2nd, 1888, all the others being bred from estray larvæ, which he found feeding on willow, exclusively. In the Can. Ent., Vol. 36, p. 350, December, 1904, Wolley Dod writes of having a single specimen from Mr. Dean, dated July 9th, 1900; this was also bred from a larva found on willow. The only other record I can find of this species is in Gibson's Entomological Record for 1908, where he states that Mr. N. B. Sanson, of Banff, had sent him a larva of this species, found on Sulphur Mountain, the resulting imago emerging at Ottawa on June 15th. Mr. Cockle's specimen is a male in fine condition, and we are glad to be able to illustrate this, as he has done so much to work up the fauna of the Kootenay country; his untiring efforts for so many years have given us a large amount of knowledge which we otherwise would not possess.

987c. *Apantesis blakei dieckì* Neu. The specimen illustrated was taken by Mr. A. W. Phair at Lillooet, but unfortunately bears no date. In Dr. Dyar's "List" (Bull. 52, U.S.N.M.) *diecki* is placed as a synonym of *determinata*, which is a race of *williamsi* Dodge, but in Cont. Lepid.

No. Amer., Barnes & McDunnough, Vol. III., No. 3, p. 159, the authors believe that *diecki*, along with our other British Columbia form *superba* Stretch, should be treated as a race of *blakei* Grt.

Unfortunately, very little material in this group is available from British Columbia, and until these various races can be bred from larva to imago, with notes on their larval and pupal stages, they cannot be definitely placed. *Diecki* was described in Amer. Ent., Vol. VI., p. 62, 1890, from Spences Bridge, B.C.

Noctuidæ (Plate II.).

1869. *Stretchia murician* Grt. We have illustrated this species, as it has been misidentified in nearly all British Columbia collections, and is generally placed under the name of *S. plusiæformis* Hy. Edw. The probable reason for this may lie in the fact that in Dr. Dyar's Catalogue (Bull. 62, U.S.N.M.) *muricina* is listed as a synonym of *plusiæformis*. There is a certain superficial resemblance between them, but they are easily separable by the following differences in maculation: In *muriciana* the pale terminal area of the primaries is sharply divided from the chestnut-brown of the rest of the wing, while in *plusiæformis* the bluish-grey outer area merges imperceptibly with the brown median band of the fore wing. Also the basal area of the latter species is of somewhat the same shade of grey as the outer area, while in *muricina* it is concolorous, with the rest of the wing, excepting the pale terminal area. In *plusiæformis* the thorax is light grey, with a distinct black collar; in *muricina* the thorax is light brown, with the patagia pale , and a narrow dark-brown colour; also in the former the fringes of the primaries are far more heavily checkered.

1871. *Stretchia plusiæformis* Hy. Edw. The specimen figured was taken by Mr. W. H. Danby at Rossland some twenty years ago, and a comparison of the two figures will show the differences that I have pointed out above. In our previous Check-lists *plusiæformis* is listed as being "generally distributed," but so far I have only seen the species from Rossland. It most likely occurs throughout the whole of that region and should be taken at Kaslo. *Variabilis* Sm., listed from Kaslo only, may be this species, but this I have not as yet seen; it was described from Colorado. *Muricina* was described from Oregon and should occur throughout British Columbia as far east as the Okanagan, but our material only indicates points on Vancouver Island and the Lower Fraser Valley.

1999. *Cucullia florea* Gn. This is another of Mr. Danby's captures from Rossland, and has not hitherto been recorded from British Columbia. The species in this genus have at all times been very difficult to separate satisfactorily, as many of them are closely allied, and although, as a rule, the species are rather uncommon, especially in the West, they have a very wide range. *Florea* is an Atlantic Coast species, its habitat being given as New York and New Jersey.

In the 1906 Check-list *obscurior* Sm. is listed from Kaslo and the Coast region. This species is now regarded as a race of *florea*. It is decidedly smaller and has much the same type of maculation, or lack of it, and is of a more even colour. We have only seen the species from Penticton and Lillooet, although Dr. Dyar records it from Kaslo in his "Kootenai" List, Proc. U.S.N.M., Vol. 27, p. 871.

2001. *Cucullia omissa* Dod. This species has been recorded from a greater number of localities in British Columbia than any other species of this genus, but the specimen illustrated is the first record of its being taken in Victoria. It was taken by the writer on June 27th, 1919, at rest on an electric-light pole and was in beautiful condition. This species was described by the late Wolley Dod in the Can. Ent., Vol. 48, p. 58, February, 1916. The type material came from a number of localities, including Nelson and Windermere, in British Columbia.

This species had been confused with *postera* Gue. (to which it is closely allied) for a number of years, and was listed from Kaslo under this name in previous British Columbia Check-lists. The known range of *omissa* in British Columbia is from Vancouver Island to the Rocky Mountains, and we have records from many intermediate points, including Princeton, Merritt, Kamloops, and Kaslo.

2412. *Cerma cuerva* Barnes. This is apparently a rather rare species. The writer has only taken two specimens in eight years—one on August 25th, 1916 (the specimen figured), and another one in rather poor condition some two or three years previous. As far as can be ascertained, it has not been taken at any other locality besides Victoria. It was described by Dr. W. Barnes (Can. Ent., Vol. 39, p. 10, January, 1907) from a single male specimen taken by Mr. A. W. Hanham in this city. It is rather a pretty insect, the fore wings being a dark brown with an olive-green tinge, sprinkled with black and white scales. There is a specimen of this species in the Provincial Museum collection labelled *Cerma olivacea* Sm., and under which name it is listed in the British Columbia Check-list.

2608. *Monodes festivoides* Gn. This is another uncommon species as far as British Columbia is concerned. The specimen illustrated was taken by Mr. G. O. Day, of Duncan, while on a collecting-trip at Lillooet last July. It is recorded from Wellington and Kaslo, and I have not heard of it from any other locality. I have seen the Wellington specimen, and it is in a very ragged condition. It was taken on June 18th, 1904. Holland, in his "Moth Book," remarks that it is not uncommon in the Eastern States.

GEOMETRIDÆ (PLATE II.).

3979. *Lygris testata* Linn. This geometer is new to British Columbia and was taken by Mr. W. A. Newcombe at Quesnel Dam on September 2nd, 1919. This is a European insect, but occurs throughout the Atlantic States; it has also been reported from Calgary, Alberta, by Wolley Dod. In the U.S. Geo. Survey, Vol. 10, 1876, "Monograph of the Geometrid Moths," Packard gives Victoria, B.C., as a locality, which is evidently an error, as *propulsata* Walk. is the only species of this genus occurring on Vancouver Island.

3990. *Thera otisi* Dyar. The specimen figured is from the nimotypical locality and was taken by Mr. Cockle on August 27th, 1919. This is not by any means a common species, and even at Kaslo is not of regular occurrence. It is reported from Cameron Lake, but this, I believe, is meant for Mount Arrowsmith, as I have seen three or four specimens (in a very poor condition) taken by Mr. Theo. Bryant many years ago and labelled from that locality. I also have a note that I saw a specimen from Lillooet a year or so ago.

**Eupithecia probata* Swett & Cassino. This pretty little geometer was described from material collected by the writer at Victoria, B.C. This species is rather uncommon and has previously gone under the name of *nevadata* Pack., with which it has been confused for many years. It is one of the earliest of our "pugs" and is generally found in company with *E. ravocostaliata* Pack., appearing about the last week in March. I have never seen them on the wing, but have generally found them in the early morning at rest on electric-light poles. In eight years' collecting I have taken but ten specimens of this species; on the other hand, its congener, *ravocostaliata*, is fairly common.

**Eupithecia moirata* Swett & Cassino. This species had been previously identified by Mr. Swett as *implorata* Hulst, but a careful study of Hulst's type by the senior author has proved that this species is new, although closely allied. It differs from *probata* in its smaller size and dark fuscous wings. It was described from specimens taken by Mr. E. M. Anderson at Penticton on April 17th and 18th, 1913. It is evidently local, as I have not seen any other specimens since, although I have examined considerable material from there during the last three years.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1920

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1920

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1921.

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1921.

To His Honour Walter Cameron Nichol,

Lieutenant-Governor of the Province of British Columbia.

May it please Your Honour:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History for the year 1920.

J. D. MacLEAN,
Provincial Secretary.

Provincial Secretary's Office,
Victoria, February, 1921.

PROVINCIAL MUSEUM OF NATURAL HISTORY,
VICTORIA, B.C., February 24th, 1921.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

SIR,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1920, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,
F. KERMODE,
Director.

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REPORT *of the*

PROVINCIAL MUSEUM OF NATURAL HISTORY

FOR THE YEAR 1920.

OBJECTS.

(*a.*) To secure and preserve specimens illustrating the natural history of the Province.

(*b.*) To collect anthropological material relating to the aboriginal races of the Province.

(*c.*) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and diffuse knowledge regarding the same.

ADMISSION.

The Provincial Museum is open, free, to the public daily throughout the year from 9 a.m. to 5 p.m. (except New Year's Day, Good Friday, and Christmas Day); it is also open on Sunday afternoons from 1 p.m. to 5 p.m. from May 1st until the end of October.

VISITORS.

The number of visitors who have signed the register of the Provincial Museum during the year 1920 is 25,850. These figures are by no means accurate, as this only includes one person to a line, although many signatures on one line include man, wife, and family. Many other people visiting the Museum do not seem to like the idea of recording their names, and no record has been kept of the children, and also of school classes who are accompanied by their teachers in connection with their nature-studies. If a turnstyle were to be installed we would then be able to record the actual number of attendance daily in the museum. The following figures will give some idea of those who recorded their names during the months of: January, 1,093; February, 1,289; March, 1,348; April, 1,603; May, 1,839; June, 2,287; July, 4,538; August, 5,607; September, 2,838; October, 1,367; November, 1,028; December, 1,023.

ACTIVITIES.

There have been added eighteen ornithological storage (moth-proof) cases to take care of the study series of bird-skins which are stored in the annex, also two walnut, plate-glass exhibition cases for the entomological section.

The Public Works Department has begun excavating the basement in the Provincial Museum, and when this is completed all the valuable study material, ornithological, anthropological, and mammals, which are stored in the wooden annex at the rear, will be removed and placed in the basement, which will be practically free from danger of fire and from probable loss in other ways.

Many applications have been made from teachers throughout the Province for scientific literature to assist them in teaching nature-studies to their pupils. It has been impossible for the Director to supply the same; the only literature we have on hand are the Annual Reports, in which the scientific research-work is noted throughout the year.

During the year the Herbarium has been greatly enriched by a large number of specimens added, which were mentioned in last year's report in the botanical section.

By an agreement between the Director of this Department and Mr. R. G. McConnell, Deputy Minister of the Geological Survey, Ottawa, the collection of Cryptograms made by Professor John Macoun were to be taken over by this Department for storage and safe-keeping, and a division of the same was to be made between the Geological Survey and the Provincial Museum. The division of these specimens has now been completed, and the collection of the Provincial Museum has been enriched by over 4,000 specimens which were collected by Professor John Macoun and named by himself and other authorities. These specimens have now been catalogued and added to the collection, the balance having been turned over to the Geological Survey, Ottawa.

The manuscript for the Check-list of the Flora of Vancouver Island is being completed and it is hoped to have it in the printer's hands within the next few weeks. In this work we have been greatly assisted by the late Professor Macoun and his son, the late J. M. Macoun.

In Memoriam.

Professor John Macoun, one of the oldest members of the Ottawa Field Naturalists' Club, died at Sidney, Vancouver Island, B.C., on July 18th, 1920, in his ninetieth year. He was born at Maralin, Ireland, about 20 miles from Belfast, on April 17th, 1831. He came to Canada in 1850.

In 1872 Mr. Macoun accompanied Sir Sanford Fleming as Botanist on an expedition to the West to explore and determine the line for the first transcontinental railway, now known as the Canadian Pacific.

In 1875 Mr. Macoun was appointed Botanist to an expedition in the Peace River country under the leadership of the late Dr. Alfred Selwyn, then Director of the Geological Survey, Ottawa, and in 1881 was appointed Botanist to the Dominion Government, although he had, at intervals, been doing work for the Government since 1872.

Perhaps the strongest trait in Professor Macoun's character was a sympathetic understanding of his fellow-men, one that made him hosts of friends and a much-sought adviser in questions of doubt and difficulty. The honesty of his opinion and the straightforwardness with which his advice was given, in conjunction with his sympathetic manner of giving it, secured for him a respect and affection that lasted a lifetime. His wonderful magnetism and ready tact constituted him a leader of men, and had his great abilities turned to statesmanship he would have been a great power for the good of his country. He was a true Imperialist and a firm believer in the strength and integrity of the British Empire.

He had many strong and outstanding personal characteristics. His determination and perseverance are marked through all his early explorations, and many accounts might be related where it was nothing but sheer determination that carried him safely through perilous and exhaustive situations.

The late Professor Macoun was the highest authority on botanical research in Canada. His loss will be keenly felt not only by the Department in Ottawa with which he had been so long connected, but also by the Provincial Museum in Victoria, to which he was a constant contributor and visitor.

ACCESSIONS.

Leg-bones of humpbacked whale taken at Kyuquot Station and presented to the Provincial Museum by Mr. W. Lawson, Vice-President of the Consolidated Whaling Corporation, Victoria, in January, 1920.

Log of wood, Douglas Fir (*Pseudotsuga mucronata*), showing portion of tree which had been cut into many years ago and how Nature provides for the covering of the hewn part. Presented by Mr. E. W. Haskell, Red Gap, B.C., March, 1920.

Collection of Fungi, Musci, Lichens, Hepaticæ, and Algæ. Collected and presented by Professor John Macoun, Sidney, B.C., April, 1920.

Plants collected and presented by: Dr. C. F. Newcombe, W. B. Anderson, W. R. Carter, W. A. Newcombe, J. G. French, Victoria, B.C.; Professor J. K. Henry, Vancouver, B.C.; and Miss Susan Beaman, Prince Rupert, B.C.

Fork-tailed Gull (*Xema sabinei*), taken at Glacier Point, Sooke, B.C., and presented by Mr. J. G. French, October, 1920.

Log of wood containing larva of Long-horned Beetle (*Prionus californicus*). Presented by Mr. C. R. Pooley, Cobble Hill, January, 1921.

Two specimens of White-winged or Iceland Gull (*Larus leucopterus*), collected by Mr. William McKay, Kildonan, V.I., January and February, 1921.

Publications of other Institutions.

(Alphabetically arranged.)

American Museum of Natural History, New York City	1
Art Institute of Chicago, Illinois	7
Alpine Club Journal, Banff, Alberta	1
Archæological Society of Ontario, Toronto, Ont.	1
British Museum, London, England	6
Carried forward	16

PUBLICATIONS OF OTHER INSTITUTIONS—*Continued.*

Brought forward	16
Brooklyn Institute of Arts and Sciences, Brooklyn, N.Y.	1
Bureau of Science, Manilla, P.I.	2
California Academy of Sciences, San Francisco, Cal.	11
California University, Berkeley, Cal.	9
Carnegie Museum, Pittsburgh, Pa.	2
Charleston Museum, Charleston, S.C.	6
Children's Museum of Boston, Boston, Mass.	2
City Art Museum, St. Louis, Mo.	6
Colorado Museum of Natural History, Denver, Col.	1
Dominion Government Publications, Ottawa	19
Detroit Institute of Arts, Detroit, Mich.	9
Field Museum, Chicago, Ill.	5
Grand Rapids Public Library, Grand Rapids, Mich.	2
Illinois State Natural History Survey, Urbana, Ill.	6
Library of Congress, Washington, D.C.	1
Louisiana State Museum, New Orleans, La.	2
Manchester Museum, England	2
Manx Museum, Isle of Man	1
Milwaukee Public Museum, Wisconsin	1
Minneapolis Institute of Arts, Minn.	9
Minnesota University, Minn.	1
Museum of Fine Arts, Boston, Mass.	8
Nebraska University, Lincoln, Neb.	4
New York Botanical Garden, N.Y.	2
Ohio Agricultural Experimental Station, Wooster, Ohio	15
Peabody Museum, Salem, Mass.	1
Peabody Museum, Yale University, New Haven, Conn.	10
Pennsylvania Museum and University	5
Philadelphia Academy of Natural Sciences, Pa.	2
Roger Williams Park Museum, Providence, R.I.	7
Smithsonian Institution, Washington, D.C.	34
Staten Island Institute, New Brighton, N.Y.	6
Sydney Museum, Australia	1
United States Department of Agriculture, Washington, D.C.	2
University of Washington, Seattle, Wash.	1
Wagner Free Institute of Science, Philadelphia, Pa.	1
Zoological Society, New York, N.Y.	2
Zoological Society, Philadelphia, Pa.	1
Total	216

The thanks of the Department are extended to the contributors, also to others who have assisted in the securing of collections and identifications of specimens, namely: Dr. C. F. Newcombe, Victoria, B.C.; Professor J. K. Henry, Vancouver, B.C.; W. B. Anderson, Victoria, B.C.; E. W. Nelson, Chief Biological Survey, Washington, D.C., and staff.

Also to the following scientists, whose names are alphabetically arranged, for the determination of entomological specimens: Drs. W. Barnes and A. W. Lindsey, Decatur, Ill.; Mr. August Busck, Washington, D.C.; Dr. H. G. Dyar, Washington, D.C.; Dr. J. H. McDunnough, Ottawa, Ont.; Dr. R. Ottolengui, New York, N.Y.; Dr. H. Skinner, Philadelphia, Pa; Mr. L. W. Swett, Lexington, Mass.

BOUNTIES OF WOLVES.

According to the Orders in Council passed under the "Game Protection Act," all applications for bounties on wolves must be sent to the Director of the Provincial Museum for verification.

It is interesting to note that for the year 1920 the Government was only called upon to pay the bounty on 124 wolves, the bounty on which was $15 per head. It will be noticed that most of these applications have come from the Northern Coast and Northern Interior of the Province, very few applications for bounties being made south of the main line of the Canadian Pacific Railway, and I have no record of any applications being made on a wolf that was killed on Vancouver Island during the year.

The following is a list of the persons to whom bounties were paid during the year 1920:—

C. B. Cole, Teslin Lake	17
C. L. Irvine, Teslin Lake	13
I. Director, Prince Rupert	13
A. J. Phillipson, Prince Rupert	12
R. Boyd Young, Port Simpson	12
Hudson's Bay Company (various localities)	10
R. Williams, Corridon Bay	8
A. C. Christenson, Bella Coola	3
R. Wilson, Prince Rupert	3
W. Goldbloom, Prince Rupert	2
Stephen Cook, Alert Bay	2
Walter Scott, Simoon Sound	2
A. Enockson, Prince Rupert	2
J. E. Ornheim, Prince Rupert	2
W. Flanagan, Rivers Inlet	2
J. L. Nygaard, Bella Coola	2
G. A. Kelly, Blondin Harbour	2
Charles Kilbourne, Simoon Sound	1
A. Anderson, Sointula	1
Mose King, Simoon Sound	1
Herbert Wait, Swanson Bay	1
A. Farquharson, Harbledown Island	1
Barnett Dopp, Fort St. John	1
J. Eklund, Prince Rupert	1
Albert Michand, Terrace	1
F. Knowles, Hartley Bay	1
W. Purl, Port Simpson	1
H. Roberts, Vancouver	1
A. Muehlbaner, Atlin	1
D. Johnson, Swanson Bay	1
L. J. Lewis, Marpole	1
Charles Bibeau, Stewart	1
J. Rogers, Prince Rupert	1
P. Brozart, Prince Rupert	1
Total	124

Several coyotes have been turned in with the timber-wolves by persons making applications for bounty; these, however, have been identified as coyotes, and bounty refused unless the pelts were turned in to the Government to receive the Government bounty, which is only $2 on this animal.

MAMMALS.

Notes on the Occurrence of a Humpbacked Whale having Hind Legs.

On January 8th, 1920, the Director took up with Mr. W. Lawson, the Vice-President of the Consolidated Whaling Corporation, Limited, Victoria, B.C., the notes which had appeared in the press in reference to a humpbacked whale having been taken at Kyuquot Station, on the west coast of Vancouver Island, which had leg-bones attached to the lower extremities of the body; this being noted by the Director as a most unusual occurrence; in fact, the first record known of any of these large animals having such an extraordinary growth.

Mr. Lawson presented these bones to the Provincial Museum. The Director received the following data from Mr. S. C. Ruck, who for a number of years was Managing Director of the

Consolidated Whaling Corporation, Limited, but now of the Vancouver Island Whaling Company, which will be of special interest, and is here copied:—

"I enclose herewith three photographs showing the unusual development of the pelvic rudiments in a whale captured at the Kyuquot Station last July, of which you have the bones. It is to be regretted that better pictures in evidence of this unprecedented development were not obtained.

"I have been connected with the whaling industry for twenty-two years, and during my time have come in contact with prominent naturalists, such as Professor True, of the Smithsonian Institution; Professor Lucas, of the Natural History Museum, Brooklyn; and Professor Andrews, of the Natural History Museum, New York; and neither in their experience nor mine have the protrusion of the pelvic bones beyond the body ever been seen or heard of.

"This particular whale was a female humpback of the average length, with elementary legs protruding from the body about 4 feet 2 inches, covered with blubber about ½ inch thick.

"As shown in the best photograph, these legs protruded on either side of the genital opening; the left leg was cut off by the crew of the vessel and lost, and the point at which it was cut off is clearly shown in the photograph. The end of the leg seen in the picture terminated in a kind of round knob like a man's clenched fist.

"The two bones of the leg which you have are connected by cartilage, which I was informed had shrunk about 10 inches, and possibly more by this time. At any rate, the total length of the leg before it was cleaned of the blubber and flesh was, as before stated, about 4 feet 2 inches from the body.

"S. C. Ruck."

Later, Mr. Roy Chapman Andrews, Assistant Curator of Mammals of the American Museum of Natural History, New York, who had done a tremendous amount of work monographing the whales of the world, heard of these most unusual appendages, and writing the Director of the Provincial Museum, asked for information regarding the same. These specimens were loaned to Mr. Andrews, who is preparing a paper on the same. Extracts from his letters no doubt will be of great interest, and are as follows:—

August 2nd, 1920. "The special excuse for this letter is to ask about some so-called exterior limb bones which were discovered on a humpback whale taken on the west coast of Vancouver Island. My friend, Mr. Sidney Ruck, of the Whaling Company, told me that one of the legs was sent to the Museum, and I shall be interested to know if you have it there; also, what the thing is like. Are there actual bones or is it only tissue and blubber? I am very much interested in the subject, and if you can give me any information I will be very grateful.

"Roy Chapman Andrews."

September 20th, 1920. "When I returned from my vacation two days ago I found the whale-bones which you sent awaiting me. I am tremendously interested in them, for they represent a phase in evolution of which I have never seen any evidence in all the whales which I have investigated, and I should greatly like to publish a short paper on the bones, and want to ask whether or not you have any objections to my doing so. Will you not let me know as soon as possible about it, for I want to take up the matter of its preparation immediately if you are willing.

"Roy Chapman Andrews."

October 7th, 1920. "Many thanks for your letter of September 27th, giving me permission to publish a paper on the external leg-bones of the humpback whale which you so kindly loaned for our inspection. I will, of course, be glad to acknowledge our indebtedness to Mr. Lawson and Mr. Ruck, and will have a number of separates sent to you.

"Roy Chapman Andrews."

Insectivorous Mammals, Family Soricidæ.

Distribution of Species occurring in British Columbia.

Shrews, or shrew-mice, as they are often named from their mouse-like form, belong to the true Insectivores. So like are these animals to mice and rats that they are often erroneously confused with them, although they are easily distinguishable by their long pointed snouts, their rounded ears closely pressed to the sides of the head, and the characteristics of the first pair of front incisor teeth; those of the upper jaw being long and generally sickle-shaped, with a more or less distinct cusp at the base of their hinder border, while in the lower jaw they are long and project horizontally forwards, in some instances curving upward at the tips, and, with the exception of perhaps one African species, have only six teeth on each side of the lower jaw.

With the exception of a few species which have taken to an aquatic life, the shrews are terrestrial and nocturnal in their habits. Shrews have a wider distribution than any other family of the Insectivores and comprise a far larger number of species.

Until quite recent years there appears to have been a diversified opinion in the nomenclature applied to many of our shrews.

In 1895 three papers by C. Hart Merriam and Gerrit S. Miller, Jr., were published by the United States Department of Agriculture (Division of Ornithology and Mammalogy) in the "North American Fauna," No. 10, revising the shrews of the American genera *Blarina* and *Notiosorex;* the long-tailed shrews of the Eastern United States; and a general synopsis of the American shrews of the genus *Sorex*. From this revision we are able to some extent to classify the shrews occurring within our limits.

From a perusal of these papers it is proposed here to briefly outline the earlier-known history of our shrews, which may be acceptable to some of our readers interested in the study of our smaller mammals.

For a long period the short-tailed shrews of the genera *Blarina* and *Notiosorex*, which so far as we know do not occur within our limits, were included in the genus *Sorex*, and were first separated by Gray in 1838 under the name of *Blarina* proposed as a subgenus; in 1842 *Blarina* was raised to full generic rank by Lesson; Baird in 1857 divided the genus *Blarina* in two sections according to the number of teeth, and Coues in 1877 recognized and named these sections as subgenera, *Blarina* proper with thirty-two teeth and *Soriciscus* with thirty; the reduction being in the unicuspids, of which there are five in *Blarina* proper, as in true *Sorex*, and only four in *Soriciscus*. The lost tooth in the latter subgenus is the second premolar.

The first short-tailed shrews known to naturalists were two specimens secured by Mr. Say, naturalist to Major Long's expedition to the Rocky Mountains in Eastern Nebraska, a few miles north of the present City of Omaha. These two specimens curiously became the types of the largest and smallest species of the genus *Blarina*, and later of the two subgenera into which the genus was split, collected during the winter of 1819–20 and described by Mr. Say in 1823, the larger as *Sorex brevicaudus*, the smaller as *Sorex parvus*.

Long-tailed Shrews of the Genus Sorex.

The first account of an American marsh-shrew was published in 1828, when Richardson described *Sorex palustris*, an animal he had found frequenting the borders of lakes in the region between Hudson Bay and the Rocky Mountains. In 1857 Baird placed *Sorex palustris* among the species unknown to him, but which he considered as probably worthy of recognition, at the same time describing the new genus *Neosorex* and the species *Neosorex navigator* from Washington.

Our first accurate knowledge of *Sorex palustris* dates from 1890, when Dr. Dobson figured the teeth of the type specimen, and in another paper published the same year discussed the validity of the genus *Neosorex*, coming to the conclusion that *Sorex palustris* and *Neosorex navigator* are the same, and that *Neosorex*, so far from being a genus, cannot even be recognized as a subgenus; a year later Dr. Merriam recorded *Sorex palustris* from Idaho, at the same time remarking that he considered *Neosorex* a very good subgenus.

The type specimen of *Sorex palustris* is in the British Museum; while its condition is such as to furnish no evidence, it was deemed necessary to judge the old descriptions on their own merits, and as all the early accounts of *Sorex palustris* refer to its pale, ash-grey belly, and as the geographical range, indefinite though it is, coincides with that of the Western animal, it is proper to apply the name to the latter.

That the type of *Sorex palustris* is a *Neosorex* and not an *Atophyrax* is shown by the teeth, which are nearly unworn; *Neosorex* is confined to North America, and, although not closely related to the Old World *Crossopus*, shows a remarkable comparison with the latter, both in habits and external appearance, both being aquatic, inhabiting marshes and the borders of streams.

All American shrews have two pelages commonly known as winter and summer coats, and, as is usual among small mammals, the moult takes place at different dates among individuals of the same species, and it is not uncommon to take specimens in different pelages on the same day in the same locality. The winter pelage is usually plumbeous, dusky or ash grey; the summer pelage, sepia brown or chestnut. In defining the various species, identification has been largely based on cranial and dental characters, such as the size and form of the brain-case, breadth of palate, length and degree of attenuation of the rostrum, and the breadth of the interorbital construction, while size and depth of emargination of the molariform teeth and the proportion of the unicuspidate teeth are the chief factors of dentition.

Comparatively little field-work has been done in British Columbia collecting our smaller mammals, many areas being untouched, where further research may furnish new material and in some instances would undoubtedly extend the geographic distribution known to us at the present time.

The following species occur within our limits:—

Sorex personatus Geoffroy St. Hilaire. Type locality, Eastern United States (exact locality unknown). Distributed throughout the Boreal and Transition Zones of North America from New England to Alaska. Specimens identified from Glacier; Field; Cariboo Lake; Sicamous; Mount Baker Range.

Sorex sphagnicola Coues. Type locality, vicinity of Fort Laird, B.C., about latitude 60. Geographic distribution, sub-arctic America from extreme Northern British Columbia (and probably Alaska) to Hudson Bay.

Sorex setosus Elliot. Type locality, Happy Lake, Clallam County, Olympic Mountains, Washington. Two specimens in the collection of the Provincial Museum from Khutze Inlet, B.C., recently identified, are placed here.

Sorex vagrans Baird. Type locality, Shoalwater Bay, Washington. Range, Southern British Columbia, Western Washington and Oregon, and Northern California (south on the coast to Monterey and in the mountains to old Fort Crook and Cassel). Restricted to Lower Boreal and Upper Transition Zones. Specimens identified from Port Moody; Sumas; Mount Baker Range; Okanagan.

Sorex vancouverensis Merriam. Type from Goldstream, Vancouver Island, B.C. General characters similar to *S. vagrans*, but larger, with decidedly larger fore feet and much darker coloration. Range, so far as we know, confined to Vancouver Island, where specimens from Victoria and Sahtlam, Parksville, Errington, and Alberni are identified as this species.

Sorex obscurus Merriam. Type locality, Timber Creek, Salmon River Mountains, Idaho; altitude, 8,200 feet. Geographic distribution, British Columbia and mountains of Western Washington; Idaho; Montana; Wyoming; Utah and Colorado; south along the high Sierra Nevada in California to Mount Whitney. Restricted to Boreal Zone. Specimens identified from Nelson; Ward; Field; Glacier; Golden; Cariboo Lake; Sicamous; Sumas; Port Moody; also Goldstream and Comox, on Vancouver Island.

Sorex obscurus longicauda Merriam. Type from Wrangell, South-east Alaska. *Sorex obscurus* is a strictly boreal species and in the United States it is exclusively a mountain animal, not descending to base-level until British Columbia is reached. In the Puget Sound region, however, and along the coast of Washington and thence northerly to Alaska it sends a representative all the way down to sea-level. This representative is larger, has developed an exceedingly long tail, and has taken on certain peculiarities of coloration, being described by Merriam as a subspecies, in the belief that intergradation with *obscurus* takes place. Three specimens examined from Port Moody, British Columbia, are more or less intermediate between *S. longicauda* and *S. obscurus*.

Sorex longicauda elassodon Osgood (Queen Charlotte Shrew). Type from Cumshewa Inlet, Moresby Island, Queen Charlotte Islands, British Columbia collected June 13th, 1900, by W. H. Osgood and E. Heller. Specimens taken at Cumshewa; Skidegate; Masset.

Sorex longicauda prevostensis Osgood (Prevost Island Shrew). Type from Prevost Island, Queen Charlotte Islands, British Columbia; collected July 3rd, 1900, by W. H. Osgood and E. Heller. Range, only known from Prevost Island, Q.C.I., and differing from the shrews of Graham and Moresby Islands to a greater degree than from the Mainland species *S. longicauda*.

Sorex trowbridgi Baird. Type locality, Astoria, Oregon. Ranges throughout Western Washington and Oregon, west of the Cascade Range. Museum specimens taken at Sumas are identified as this species.

Sorex palustris navigator (Neosorex) Baird. Type locality unknown, stated to be Fort Vancouver, Washington, but probably northern Idaho. Geographic distribution, the Rocky Mountains and outlying ranges from British Columbia to Southern Colorado and the Sierra Nevada of California, south to the Sequoia National Park. Specimens identified from Nelson; Cranbrook; Lillooet; Atlin; Lake District, near Victoria, Vancouver Island.

Sorex bendirii (Atophyrax) Merriam. Type, Klamath Basin, Oregon. Range, Klamath Basin, Oregon, northward along east side of Cascade Range to Puget Sound, westward to coast of California and south to Sonoma County. Museum specimens taken at Sumas are referred to this species.

A number of small mammal-skins were sent to Mr. Edward Nelson, Chief, Biological Survey, Department of Agriculture, Washington, D.C., early in the year for identification, and these, having been identified by members of his staff, were returned in April. The identifications of the *Sorex* and *Neosorex* have been made by Dr. Jackson, who is engaged on a critical study of these groups, and the *Peromyscus* by Mr. Howell and Mr. Preble.

The following is the list of mammals sent and identified:—

Peromyscus.

(Catalogue No. of Skins with Corresponding Skulls.)

297. *Peromyscus maniculatus borealis.*
298. *Peromyscus maniculatus borealis.*
299. *Peromyscus maniculatus borealis.*
304. *Peromyscus maniculatus borealis.*
305. *Peromyscus maniculatus borealis.*
308. *Peromyscus maniculatus borealis.*
409. *Peromyscus maniculatus artemisiæ.*
411. *Peromyscus maniculatus artemisiæ.*
452. *Peromyscus maniculatus artemisiæ.*
453. *Peromyscus maniculatus artemisiæ.*
454. *Peromyscus maniculatus artemisiæ.*
457. *Peromyscus maniculatus oreas.*

Sorex.

(Catalogue No. of Skins with Corresponding Skulls.)

922. *Sorex v. vagrans.*
923. *Sorex o. obscurus.*
924. *Sorex o. obscurus.*
925. *Sorex p. personatus.*
926. *Sorex v. vagrans.*
931. *Sorex v. obscurus.*
932. *Sorex v. obscurus.*
934. *Sorex v. obscurus.*
938. *Sorex v. obscurus.*
940. *Sorex v. obscurus.*
944. *Sorex v. vagrans.*
947. *Sorex o. obscurus.*
949. *Sorex vancouverensis.*
950. *Sorex o. setosus.*
952. *Sorex vancouverensis.*
961. *Sorex v. vagrans.*
962. *Sorex v. vagrans.*
963. *Sorex v. vagrans.*
974. *Sorex v. vagrans.*

(No. of Skins with no Skulls.)

948. *Sorex o. obscurus.*
951. *Sorex o. setosus.*
957. *Sorex vancouverensis.*

Neosorex.

(Catalogue No. of Skins with Corresponding Skulls.)

977. *Neosorex p. navigator.*
978. *Neosorex p. navigator.*
979. *Neosorex p. navigator.*
980. *Neosorex p. navigator.*
981. *Neosorex p. navigator.*
982. *Neosorex p. navigator.*
983. *Neosorex p. navigator.*
984. *Neosorex p. navigator.*
985. *Neosorex p. navigator.*

Some Notes on the Earlier-known History of the Chiroptera, with List of those Species occurring in British Columbia.

Of our smaller mammals no order of such magnitude with such a wide geographical distribution produces a greater field for research than the Chiroptera, inhabiting, as it does, the Eastern and Western Hemispheres to the northern and southern limits of tree-growth, extending in the Pacific Ocean from America to Hawaii and the Galapagos Islands, and from Asia to New Zealand, Samoa, the Caroline and Ladrone Islands.

Bats are distinguished from all other mammals by possessing the power of true flight like that of birds, their fore-limbs being specially modified for this purpose, resulting in the order to which they belong being appropriately named Chiroptera, or hand-winged.

Certain other mammals such as the flying squirrels of genus *Sciuropterus* and the flying phalangers have a spurious flight, which is nothing more than an extension of an upward or downward leap by the aid of parachute-like expansions of the skin of the sides of the body, and cannot be extended upward beyond the limits of the impetus of the original leap.

The essential characteristic of all bats is their power of flight, and so far as we know no clue has been discovered by scientists among the extinct fauna of which we have knowledge which in any way connects them with other mammals, but it has been found that, in their essential structure, bats are so closely allied to the Insectivores, such as shrews and moles, that many naturalists express little doubt of their derivation from the ancestral forms of that order, and think it probable that the power of true flight was developed gradually from spurious flight.

Like many of our smaller mammals, classification has been based largely on dental characters, which differ very materially in the genera living on various foods.

The great majority of bats feed solely on insects and have their cheek-teeth furnished with a number of sharp cusps; the fruit-eating bats comprising the so-called flying foxes or fruit-bats of the warmer regions of the Old World, and among them the largest representatives of the order are characterized by the molars having nearly or quite smooth crowns, elongated from back to front and divided by a deep longitudinal groove; while the blood-sucking bats of South America have the front teeth specially modified for piercing the skin of animals.

The bats often locally called "leather-bats" or "flittermice," in which our particular interest is centred, inhabit the temperate regions, are insect-feeding, and belong to the family Vespertilionidæ; these bats, being dependent for their nourishment upon a full supply of insects, must in winter either migrate to warmer regions or hibernate.

To what extent some of our bats migrate appears to be imperfectly understood, but that bats migrate is an established fact; one of the earliest references made on the subject is by our great authority, Dr. Dobson, in his Catalogue of the Chiroptera in the British Museum.

It is claimed that of European species probably with one exception they hibernate, but on the American Continent we find in the "Transaction of the Royal Society of Canada," V., Section V., page 85, where Dr. C. Hart Merriam shows conclusive evidence of two of the American bats, *Lasionycteris noctivagans* and *Lasiurus cinerius*, have regular periods of migration, and Gerrit S. Miller, Jr., in his revision of the North American bats of the family Vespertilionidæ, records his observations at Highland Light, Cape Cod, Massachusetts, during the months of August and September, 1890 and 1891, where he observed the migration of the same two species together with *Lasiurus borealis*. From these and other recorded observations it is fair to assume that the migration of bats is probably as definite as to dates and paths as that of birds.

Bats seldom feed on the ground, most species feeding and drinking on the wing. Dr. Merriam observes that "all North American bats, except when their habits have been modified by proximity to man, may be classed as cave-dwelling or tree-dwelling, according to the places in which they spend the day; as a rule the cave-dwelling species live in large colonies, while the tree-dwelling live singly or in small companies."

It is estimated by the highest authorities that little more than one-half of the living species are known to science at the present time, and it may be interesting to trace to a small extent the history and development of the classification of bats from the earliest naturalists.

Linnæus in 1758 knew seven bats, all of which he placed in *Vespertilio*, the fourth and last genus of the order Primates. In 1808, as recorded by Tiedemann, the order Chiroptera had been recognized, while with the addition of the flying lemur the genera was only seven and the species fourteen.

The real foundation for our present classification was laid by Gray in 1821, when he published the first of his many papers on bats; Gray excluded the flying lemur, recognized the two main subdivisions of the order made by Goldfuss in 1820, and applied to the names of families the system of nomenclature now in use.

In 1827 Lesson in his "Manuel de Mammalogie" once more associated the flying lemur with the bats, making the group a division of the Carnivores.

A revision of the genera of bats of the family Vespertilionidæ was made by Gray in 1838, where he abandoned his earlier plan and adopted the main divisions introduced by Spix in his "Simiarum et Vespertilionum Brasiliensium Species Novac," published in 1823.

Peters in 1865 divided the group into 10 families and subfamilies, containing 59 genera.

Dr. Dobson described 401 species, 80 genera, and 14 families and subfamilies when he published his Catalogue of the Chiroptera in the British Museum, 1878.

In 1904 Trouessart recorded 851 species, 122 genera, and 18 families and subfamilies, while Gerrit S. Miller, Jr., whose revision of the North American bats of the family Vespertilionidæ was published by the United States Department of Agriculture (Division of Biological Survey), October 16th, 1897, as "North American Fauna" No. 13, and ten years later while Assistant Curator, Division of Mammals, United States Museum, after examining the material in all the leading museums of Europe and America, wrote his work on the "Families and Genera of Bats," published as Bulletin 57 by the Smithsonian Institute, in which he concluded at that time among the known species at least 173 genera and 36 families should be recognized, being also of the opinion that probably the total number of recognized bats will eventually exceed 2,000 named forms.

The following bats occur in the Province of British Columbia:—

Corynorhinus macrotis townsendii Cooper. Type locality, Columbia River, Oregon. Geographic distribution, humid coast district of Oregon, Washington, and Southern British Columbia. Specimens identified from Comox, Vancouver Island.

Myotis lucifugus alascensis Miller. Type from Sitka, Alaska? Ranges throughout the humid coast district of Southern Alaska and Northern British Columbia. Specimens identified from Masset, Queen Charlotte Islands. A single specimen taken at Errington, Vancouver Island, August 31st, 1910, has been provisionally referred to this form by H. S. Swarth.

Myotis yumanensis saturatus Miller. Type from Hamilton, Washington. Geographic distribution, Transition Zone in Oregon, Washington, and British Columbia. Specimens identified from Shuswap; Kamloops; Kultus Lake (near Chilliwack); Mount Lehman; Port Moody; Sumas.

Myotis californicus caurinus Miller. Type from Masset, Queen Charlotte Islands, B.C. Geographic distribution, the humid coast district of British Columbia, Washington, and Oregon. Specimens identified from Port Moody and Masset, Queen Charlotte Islands.

Myotis subulatus Keenii Merriam (Keen's Bat). Type locality, Masset, Queen Charlotte Islands, B.C. Geographic distribution at present known from the type locality only. No doubt occurs throughout most of the humid north-west coast district.

Myotis evotis H. Allen (Long-eared Bat). Type locality not stated, and no type designated —possibly Monterey, California. Geographic distribution, Austral and Transition Zones from the Pacific Coast to the eastern edge of the Rocky Mountains. Specimens identified from Shuswap; Victoria.

Lasionycteris noctivagans Le Conte (Silver-haired Bat). Type locality, Eastern United States. Geographic range, North America from the Atlantic to the Pacific. Museum specimens from Okanagan and Sahtlam, Vancouver Island, are referred here. A single adult male was taken at Skidegate, Queen Charlotte Islands, B.C., on the evening of June 10th, 1900. (W. H. Osgood, "North American Fauna," No. 21.)

Vespertilio fuscus Beauvois (Brown Bat). Type locality, Philadelphia, Pa. Geographic distribution, Austral, Transition, and lower edge of Boreal Zones throughout the United States and British Provinces. Specimens identified from Ashcroft; Okanagan; Errington, Vancouver Island.

Lasiurus cinereus Beauvois (Hoary Bat). Type locality, Philadelphia, Pa. Geographic distribution, Boreal North America from Atlantic to Pacific. Museum specimens from Okanagan and Victoria, B.C.

The Life-history and Distribution of Marmots.

True marmots inhabit the northern portions of both the Old and New Worlds; in the southern portions of their range in the Old World these mammals are found only at considerable elevation above sea-level, but in more northern districts like the Siberian steppes they are found on the lowland plains.

The districts inhabited by all the Old World species, being desolate and barren, are usually subject to intense heat in summer and cold in winter.

In North America marmots are found distributed over a greater part of Canada and the United States, having a number of vernacular names by which they are commonly known in their geographic distribution.

In Eastern Canada, especially in the Province of Quebec, they are known by the name "siffleur"; in Ontario we hear of the woodchuck or ground-hog; the yellow-footed marmots of Southern British Columbia are known as woodchucks or rockchucks, while the hoary marmots of the mountains, the largest of our species, comparing favourably in size with the Alpine species of the Old World, are commonly called whistlers.

The name "siffleur," probably taking precedent, was applied to the woodchuck of Eastern Canada by Baron La Hontan in 1703.

In 1743 Catesby described the Eastern woodchuck under the name of "The Monax," while three years later Edwards published a more extended account under the title of "The Monax or Marmotte of America," his description furnishing the basis of the first technical name applied to the species—*Mus monax* Linnæus.

For the next few years the name given to the genus underwent several changes until Blumenbach in 1779 named the genus *Marmota;* however, this was upset the following year by Schreber, who introduced the name *Arctomys;* while of later date than Blumenbach's, nevertheless received general acceptance and continued in common use for the marmots until the early years of the present century, when the name *Marmota* was restored as the proper appellation of the genus. (Trouessart, E. L. Cat. Mamm. Suppl. 1904, page 343.)

The American marmots are naturally divided into three very distinct groups, as follows:—

Monax group: All the Eastern woodchucks, the Canada woodchuck, the British Columbia woodchuck, and the Ochraceous woodchuck of Alaska and Northern British Columbia.

Flaviventris group: All the yellow-footed marmots.

Caligata group: The hoary marmot of the mountains, including the species *caligata, olympus,* and *vancouverensis.*

Marmots, although chiefly diurnal, are sometimes nocturnal in their habits, feeding mainly on grass, succulent plants, and seeds; the Eastern species often doing considerable damage to cultivated forage-crops both by eating and trampling underfoot, and occasionally much havoc is made by their visits to kitchen-gardens. These marmots, originally living in the woods, prefer open clearings, where they are usually found in pairs or families, having their burrows under rock-piles, stone walls, stumps, roots of trees, and often in open meadows.

The yellow-footed marmots prefer rocky hillsides, in the crevices of cliffs, or under rock-piles in meadows, and are often abundant in the higher part of mountains, where they dwell more or less in colonies, their food being similar to that of the Eastern species, but probably including a greater proportion of native plants. These marmots also, when living at lower altitudes in close proximity to settlement, are exceedingly destructive to cultivated crops.

More gregarious in their habits, like all the Old World species, hoary marmots in the southern part of their range are always found about rock-slides around timber-line, but in Northern British Columbia and Alaska they are frequently found at low altitudes, often making their burrows in open meadows or grassy hillsides; while little is known of their feeding habits, it is generally conceded they feed like the other species.

They are extremely partial to fine weather, feeding during the summer months both early and late, and are extremely fond of sunning themselves on their mounds or projecting rocks where they feel safe from attack, spending a large part of their time during wet, dull, and stormy weather in their burrows. As fall approaches they become less active, often only appearing for a few hours during the hottest part of the day.

When alarmed they rush at once to the entrance of their burrows and sit up on their hind-quarters to survey the scene and detect the danger. Should the enemy approach too close a loud shrill whistle is uttered and they disappear into their burrows, reappearing after a time to see if all danger is passed. The whistling of the hoary marmot, being more pronounced, can be heard for a considerable distance; it is from this habit the name "whistler" has been applied and the name "siffleur" to the woodchuck of Eastern Canada.

Marmots usually produce from four to six at a birth, the young of the Eastern and yellow-footed species appearing about the latter part of May, while the hoary marmots probably breed somewhat later. Little information on this point is at hand. Swarth states "that in Southern Alaska young individuals of *M. c. caligata* were seen running about in the middle of June, but on Vancouver Island during the first three weeks of July no young ones of *M. vancouverensis* had yet emerged from the burrows."

Laying up no store of food for winter use, all species of these marmots hibernate and become dormant during winter for a period of from four to six months, hibernating from the middle of September or October until the middle or latter part of March. Some of the yellow-footed species have been known to retire as early as the middle of August, when weather is genial and food abundant, the dates varying with the altitude and local condition, those individuals living in the valleys denning up earlier than those living higher up the mountains; in mild winters they occasionally appear at the mouth of their burrows in February, but re-enter their burrows and again become dormant if the temperature falls.

Of extinct and allied forms we know little. Remains of extinct species of *Susliks* occur in the higher Tertiary rocks of Europe, and the Upper Eocene beds of France produce evidence of an extinct but apparently allied genus known as *Plesispermophilus*. More primitive are the forms described as *Plesiarctomys*, which, while showing certain resemblances both to the marmots and squirrels, are found in the middle Tertiary deposits both of Europe and North America.

Species known to British Columbia.

Marmota monax canadensis (Erxleben). Type locality given as Quebec, Canada. Distribution, greater part of interior of Canada from Great Slave Lake and York Factory, south to Southern Alberta (Red Deer), Central Saskatchewan (Cumberland House), Northern Wisconsin and Michigan, Central Ontario, Southern Quebec, New Brunswick, and Nova Scotia.

"A single young specimen in very worn pelage from near the head of Finlay River, British Columbia, seems referable to *canadensis*, but with more material from this region may necessitate its reference to *ochracea*." (A. H. Howell.)

Marmota monax petrensis (British Columbia Woodchuck). Type from Revelstoke, British Columbia; collected May 12th, 1890, by W. Spreadborough. Distribution, interior ranges of Southern British Columbia and adjacent parts of United States; from Barkerville, British Columbia, south to Thompson Pass, Idaho. Specimens identified from Barkerville; Glacier; Revelstoke.

Marmota monax ochracea Swarth (Ochraceous Woodchuck). Type locality, head of 40-Mile Creek, Alaska. Distribution, interior mountain ranges of Yukon and Northern British Columbia from 40-Mile Creek south to the Babine Mountains. Specimens identified from Babine mountains; Pike River, Atlin; Takla Lake. A short series of skulls without skins from Stuart Lake is provisionally referred to this race.

Two museum specimens, Nos. 247 and 248, collected at Pike River, Atlin, July 29th, 1914, and identified as this species by Mr. A. H. Howell, Biological Survey, Washington, show two varying phases—No. 247, an immature female, being very dark blackish brown all over, with the exception of a few greyish hairs on nostrils and lower lip. Indians and whites who are well acquainted with this locality state that whole colonies of marmots of this colour have been observed by them. The other, No. 248, also an immature female, is a pale reddish cinnamon tipped with a very pale reddish buff, giving it a bicolour appearance; under-parts cinnamon rufous. With such phases occurring it is very desirable to have a large series of skins with skulls from this particular locality.

According to Mr. Howell in his revision of the genus, published in 1915, "Melanism is most strongly developed in the subspecies *Marmota caligata vigilis*, occupying the region around Glacier Bay, Alaska, and that no purely black specimens of *M. monax* have been seen, but a melanistic phase is rather common in New York and New England."

Marmota flaviventris avara Bangs (Pallid Yellow-bellied Marmot). Type locality, Okanagan, British Columbia. Distribution, interior valleys and foot-hills of Southern British Columbia and Eastern Washington and Oregon. Specimens identified from Ashcroft; Cascade; Midway; Nicola Valley; Okanagan; Penticton; Vernon.

Marmota caligata caligata (Eschscholtz) (Northern Hoary Marmot). Type locality, Bristol Bay, Alaska. Distribution, Alaska and Yukon from the Portland Canal, north on the coast to Bristol Bay, and in the interior to the Endicott Range and the mountains lying westward of Fort Good Hope, Mackenzie. Specimens identified from Bennett; Cheonee Mountains; Atlin.

Marmota caligata oxytona Hollister (Robson Hoary Marmot). Type locality, head of Moose Pass, branch of Smoky River, Alberta; altitude, 7,200 feet. Distribution, interior of Northern

British Columbia and Southern Yukon, from Teslin Lake and Laird River south to Barkerville, British Columbia, and the Mount Robson region of British Columbia and Alberta. Specimens identified from mountains near Babine; Barkerville; Finlay River; Laurier Pass; Level Mountain; McConnell Creek; Moose Pass; Moose River (North Fork); Sheslay River; Stuart Lake; Sustut Mountains; Thudade Lake.

Marmota caligata okanagana (King) (Okanagan Hoary Marmot). Type locality, Gold Range, British Columbia. Distribution, Gold and Selkirk Ranges, British Columbia, and probably main range of the Rocky Mountains in Alberta from Banff to Henry House; exact limits unknown. Specimens identified from Field; Glacier; Spillimacheen River; Toad Mountain, south of Nelson.

Marmota caligata cascadensis Howell (Cascade Hoary Marmot). Type locality, Mount Rainier, Washington; altitude, 6,000 feet. Distribution, Cascade Range at and above timber-line from Mount Rainier, Washington, north to Southern British Columbia. Specimens identified from mountains near Chilliwack; Hope; Howe Sound; Mount Baker Range near United States Boundary; Skagit River; Spences Bridge; Tammi Hy Mountain.

Marmota vancouverensis Swarth (Vancouver Island Marmot). Type locality, Mount Douglas, near Alberni, Vancouver Island, British Columbia; altitude, 4,200 feet. Distribution, Vancouver Island, British Columbia. Known at present only from the mountains at the head of China Creek, some 20 miles south-east of Alberni, in the Golden Eagle Basin and King Solomon Basin and the surrounding slopes and ridges.

Howell writes in his remarks of this species: "This peculiar marmot, although clearly related to the Mainland species (*Caligata*), has, through isolation, developed striking characters, both external and cranial. The tendency of isolated coastal forms in this group to become brown (shown in a lesser degree by *M. caligata vigilis* and *M. olympus*) has reached the greatest extreme in this species, the black colours of the Mainland forms being entirely lacking and the white reduced to scattering hairs. After a season's exploration of the southern part of Vancouver Island, Swarth came to the conclusion that the species is probably confined to a small area in the vicinity of Mount Douglas." Specimens identified from Golden Eagle Basin; King Solomon Basin; Mount Douglas.

ADDENDA.

Omitted in the list of *Microtus* occurring within the Province published in our Annual Report of last year (1919) is:—

Microtus richardsoni arvicoloides (Rhoads) (Cascado Water-vole). Type locality, Lake Keechelus, near Snoqualmie Pass, Kittilas County, Washington; altitude, 3,000 feet. Geographic distribution, Boreal Zone of Cascade Mountains in Washington, Oregon, and Southern British Columbia. Museum specimens from Mount Baker Range.

This subspecies, the largest of our voles, appears to be hardly separable from *Microtus r. macropus* of the Boreal Zone of the Rocky Mountains. According to Vernon Bailey in his revision of the genus, a single specimen examined from Glacier, British Columbia, was fairly intermediate between *Microtus richardsoni* (De Kay) and these two southern subspecies.

ORNITHOLOGY.

As no field collecting was done by any one of the Department this year, very little ornithological material was secured; however, three species of birds of special interest can be recorded here:—

Sabine's Gull (*Xema sabini*) (Fork-tailed Gull). Although this bird had been on our list of British Columbia birds for a great many years, the specimen secured at the request of the Director by Mr. J. G. French, of Glacier Point, Sooke, B.C., on October 11th, 1920, was the first specimen to be received by the Provincial Museum. The range of this bird is Arctic Seas to Southern America. It breeds on the coast of Alaska from Kuskokwym River to Norton Sound, and in the Northern Mackenzie, Northern Keewatin, and Northern Greenland, and on the Arctic Islands of Europe and Asia; in migration on both coasts of America and casual in the Interior. Winters in Peru. Shortly after Mr. French had secured this specimen the Director and his assistant saw several in the vicinity of Victoria Harbour.

Two other specimens which are of considerable interest were collected for this Department—namely, the Iceland gull (*Larus leucopterus*)—one of which was taken in January, 1921, and the other in February, 1921. These birds were taken at Kildonan, Barkley Sound, B.C., by Mr. W. McKay.

Mr. J. W. Thompson having spoken to the Director of two gulls that had been noticed in the vicinity of Kildonan during the month of December, both pure white (and his description was so definite that they could not be mistaken for any other bird than that of the Iceland gull), the Director requested Mr. Thompson to have some person, if possible, secure these birds for this Department.

The birds are pure white throughout, about the size of the glaucous-winged gull, but having no pearl-grey mantle, being finely streaked with a very light-greyish tinge. The primaries are white throughout. Total length of the bird is about 24 inches. The feet are flesh-coloured; bill, flesh-coloured with black tip; the iris is yellow. The range of this bird, according to the A.O.U., is given as Arctic regions. Breeds from Victoria Land (Cambridge Bay) and Boothia Peninsula to Central Greenland and east to Nova Zembla; winters from Southern Greenland south to Long Island; casual on the Great Lakes; accidental in Nebraska and Maryland; in Europe south to the British Isles, Scandinavia, and Baltic Sea.

Another very peculiar-looking gull was seen by the Director and members of his staff on the lawn in front of the Parliament Buildings, Victoria, from October 13th to 25th, 1920, at intervals during these days on the arrival of the C.P.R. steamers.

This bird appeared after the arrival of one of the boats that plies on the triangular route between Victoria, Seattle, and Vancouver. It would arrive about 3 p.m. with the boat, and when the same boat was leaving at 4.30 p.m. the bird would disappear. It appeared to be following this particular boat for some time in and out of Victoria harbour. The following is a description of the gull noted by the Director:—

Back of head and nape, creamy white; bill, yellowish, bright-red spot on lower mandible like a herring-gull; well-defined collar on the neck of umber brown; throat and abdomen uniform dark brownish; wings pearly grey with black primaries and white spots. Mantle showing pearl grey intermixed with brown umber; tail, white.

Notes on the Chinese Starling (Acridotheres cristatellus).

Many inquiries have been made from time to time in regard to a bird which is found in the heart of Vancouver City. This bird is about the size of our red-winged blackbird; is a bird that is uniform black throughout, with the exception of a dirty white spot in the primaries which is seen very distinctly in the primaries and secondaries when in flight. It has a small crest on the head; the bill is whitish horn colour; feet, yellow horn colour; iris, yellow. On the end of the tail there is a narrow band of a dirty greyish white.

The first record I have of this bird was a specimen collected by the Director in November, 1904, in the heart of Vancouver City between the old Court-house which stood on Hastings Street and the public school. My attention was first drawn to this bird by the Hon. Mr. Justice Martin. The specimen secured was at that time not known to the Director, and was sent to Washington D.C., for verification, and was identified as *Acridotheres cristatellus*, a native of Southern China, and had been reported from the Island of Luzon, in the Philippines. There were very few of these birds in Vancouver at this time, although Mr. V. W. Mitchell, of Vancouver, recently informed me that he had first noticed the bird in the year 1897, only seeing two pairs. These birds have increased considerably the last few years, and appear to make their main roost on the corner of Carrall and Cordova Streets, roosting on the sides of the buildings on ledgings under the large overhanging cornices. These roosts now contain approximately 1,200 birds. They leave their roosts in the early morning and fly off into the adjacent surroundings to fields and gardens for food. These birds are very noticeable in the afternoons about one hour before dusk, when they fly back to this roost for the night; they make a considerable noise, chattering and whistling until darkness, drawing the attention of many passers-by.

I have no record of these birds doing any harm to agricultural interests, but they should be watched and observed very closely in regard to agriculture. Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, informs me he has two authentic records of these birds from persons who have observed them destroying the tent-caterpillar, which has become a considerable pest in Vancouver City.

It might be of interest here to note an extract from a Bulletin published by Richard McGregor, Ornithologist to the Bureau of Science, Manilla, where this bird had been imported to the Island of Luzon, in the Philippine Islands, many years ago, which is quoted below:—

"The next bird that will be noted even by those who are not devoted to ornithology is a slate-grey starling, *Æthiopsar cristatellus* (Linnæus), about the size of an American robin. When this bird flies a white band across the primary quills is conspicuously displayed. The feathers of the frons are long and erect or strongly antrorse, giving the head a curious profile view. The larger tail-feathers are tipped with white. For several years there was a roost of these starlings in the trees in front of the Luneta Police Station, on Bagumbayan Drive, where their chatter was very noticeable at dusk. A closely related species, *Acridotheres tristis* (Linnæus), was introduced into Hawaii, where it is well established; I found it extremely abundant on Maui Island in 1900. Both of these species are natives of Southern Asia.

"*Æthiopsar cristatellus* appears to have been introduced by the Spanish Government about 1850 with the hope that it would reduce the number of locusts, which were and still are a very serious pest to the agriculturist.

"A quotation in Blair and Robertson indicates that at least three attempts, 1849 to 1852, were made to introduce and establish a species of martin (probably one of the starlings) in the Philippines. Foreman says:—

"'In 1851 the Government imported some martins from China with the hope of exterminating the locusts. When the birds arrived in the Port of Manila they were right royally received by a body of troops. A band of music accompanied them with great ceremony to Santa Mesa, where they were set at liberty, and the public were forbidden to destroy them under severe penalties.'

"'Martin' as a Spanish word, is correctly applied to birds called 'starlings' in English, and is not equivalent to 'martin' (species of Hirundinidæ). I have been under the impression that the bird introduced into the Philippines received its local name from Juan Antonio Martinez, Governor from 1822 to 1825, but this Governor left the Philippines twenty-five years before the arrival of *pajaros martines*. Casto de Elera gives the name *martin langostero* for *Acridotheres cristatellus*."

There is no record of any definite data as to how this Chinese starling came to be found in the vicinity of Vancouver; it is presumed that this bird was probably brought here direct from the Orient by one of the Oriental liners, and that it escaped or was liberated.

The Provincial Museum now has three specimens which have recently been collected.

BOTANY.

While no field collecting was undertaken by any of the staff of the Provincial Museum, the Herbarium collection is steadily growing, for which appreciation must be extended to Mr. W. B. Anderson, Dr. C. F. Newcombe, and others for the donation of a number of interesting specimens not hitherto in the collection.

Mr. Anderson's contributions are desirable and extensive, covering a large range of territory within the Province, including Anaham, Hazelton, and districts adjacent to Fort George, the Columbia River Valley, and Southern Okanagan.

Many of these plants have been mounted and placed in the Herbarium collection, among which are to be found the following of special interest:—

Adiantum-Capillus-Veneris L.
Pellæa occidentalis (Nels.) Rydb.
Calla palustris L.
Lilium montanum (A. Nels.).
Peramium repens Salish.
Salix sp. *fluviatilis* Nutt.
Comandra livida Richards.
Rosa Woodsii Lindl.
Astragalus tenellus Pursh.
Hedysarum boreale Nutt.
Hedysarum sulphurescens Rydb.
Oxytropis monticolor Gray.
Clarkia pulchella Pursch.
Phlox Douglasii Hook.
Castilleja lutescens (Greenman) Rydb.
Orthocarpus luteus Nutt.
Orthocarpus tenuifolius Benth.
Pentstemon pinctorum Piper.
Pentstemon Richardsonii Dougl.
Lobelia Kalmii L.
Crepis elegans Hook.
Circium sp. *foliosus* Hook.
Ratibida columnaris (Sims) D. Don.
Solidago corymbosa Nutt.
Solidago decumbens Greene.
Tetradymia canescens DC.

There are also several asters and species of Compositæ not yet determined.

Plants collected in the vicinity of Victoria and presented by Dr. C. F. Newcombe:—

Brasenia Schreberi Gmel.
Platyspermum scapigerum Hook.
Lupinus lepidus Dougl.
Orobanche comosa Hook.
Artemisia canadensis Michx.
Agoseris laciniata (Gray) Greene.

Further additions are:—

Loiseleuria procumbens Desv. From the vicinity of Prince Rupert; presented by Miss Beaman.

Potentilla paradoxa Nutt. Collected at Spences Bridge, B.C., August 6th, 1920, and presented by Mr. W. A. Newcombe.

Carex Crawei Dewey. Collected at Golden, B.C., June 20th, 1920, and presented by Professor J. K. Henry.

Hydrophyllum tenuipes Heller; *Calamagrostis aleutica* Trin. Vancouver Island specimens presented by Mr. J. G. French.

Gentina propinqua Richardson. Collected at Cameron Lake, V.I., August 6th, 1916, by Mr. W. R. Carter and identified by Professor C. V. Piper, this being a new addition to the Vancouver Island flora.

Among these contributions the following appear to be new additions to the flora of British Columbia:—

Carex Crawei Dewey.
Potentilla paradoxa Nutt.

During the season a large number of plants have been identified for children attending some of the Victoria City schools and others residing in several districts of Vancouver Island. These plants were brought in by Miss M. Lawson, of the *Colonist* staff, who gave up a great deal of time and work in the interests of the children by publishing a list weekly in the Sunday edition of the *Daily Colonist.* This created a marked competition between the collectors, and, besides keeping up their individual interest, was decidedly effective as an educational lesson in nature-study by teaching them the names of some of their native flora.

Some of the plants received were in such poor condition that identification was impossible, and it is desirable, should this work be continued, that some simple methods be followed in collecting and preparing specimens which would be beneficial to all concerned.

It is worthy of mention that among the plants received were two (both introduced plants and probably garden escapes), which, so far as we know, have not been previously recorded in British Columbia, growing in a wild state, namely:—

Borago officinalis L. Collected at William Head by Miss Barbara Cox.

Nothoscordum bivalve (L.) Britton. Collected on Foul Bay Road, Victoria, by Master Jack Miller.

ENTOMOLOGY.

BY E. H. BLACKMORE, F.E.S.

In my remarks in the Provincial Museum Reports for the years 1918 and 1919 special mention was made of the scarcity of insects in general and noctuids in particular, thinking that we had reached the limit in this respect, but from a collecting standpoint neither of those years was as bad as the season just past. The weather conditions were somewhat abnormal, the total rainfall for this year being 3 inches above the annual average, eight months out of the twelve being above the average precipitation; this, together with a great deal of cool weather in the early spring, made collecting conditions very unsatisfactory.

The fall collecting was also exceedingly poor, as it started to rain on September 8th and continued more or less until the end of the collecting season. Notwithstanding these drawbacks, some very interesting material was taken during the season, and it only goes to prove that if continuous and persistent collecting is carried on one can always turn up some rare and uncommon species, however unfavourable the season may be from weather conditions or other causes.

Some two or three years ago, on looking over the list of Microlepidoptera as recorded in the 1906 Check-list of British Columbia Lepidoptera, I was very much struck with the comparatively few species listed from Vancouver Island (excepting Wellington), and especially from Victoria.

Upon making a list of the localities given, I found that out of 278 species recorded from British Columbia 168 have been taken at Kaslo and 94 were listed from Wellington. The number of species recorded from other localities are as follows: Vancouver Island, 24 (no specific localities given); Victoria, 16; Vancouver, 7; and Atlin, 3. Some of the species were naturally recorded from several localities, but the large majority of species were either taken by Mr. J. W. Cockle at Kaslo or Mr. Theodore Bryant at Wellington. It is very evident from these figures that, outside of the above-named gentlemen, very little collecting of these small but interesting moths had been undertaken in any part of the Province. During the past few years, however, Messrs. Day and Hanham, of Quamichan Lake, near Duncan, have added a number of new species, and Mr. Cockle has considerably augmented his earlier list.

With the idea of extending our knowledge of the "Micro" fauna of the southern portion of Vancouver Island, the writer devoted most of his time during the past season to the acquisition of material in this group, but owing to illness was not able to get into the field until June. From then until October I made collections at Maillardville, Goldstream, Mount Newton, and many points in the vicinity of Victoria. Mr. W. R. Carter, of the Museum staff, also assisted in the work and brought in some good material. I was fortunate in securing the co-operation of Mr. L. E. Marmont, of Maillardville, who collected extensively in that district. The material sent in by him was very desirable, as it contained several species new to British Columbia, besides a number of species previously recorded from the Interior.

From the material collected during the season the writer was enabled to mount over 1,200 specimens, comprising some 145 species; amongst these were four new to science, one new to North America, and about thirty new to British Columbia. We have also verified a number of species already listed and have added considerably to our knowledge of the known range of a great many species.

We hope during the coming season to continue this work and would be glad to hear from any collectors who would be willing to send in specimens in series, as there are without doubt a large number of species occurring in the Province of which we have no record at present.

Appended is a list of the species of Microlepidoptera taken at Victoria, Goldstream, and Maillardville during the past season which are not included in the 1906 Check-list of British Columbia Lepidoptera. Many of these are new records for the Province.

(Arranged according to Barnes & McDunnough's Check-list of the Lepidoptera of North America.)

PYRAUSTINÆ.

4992. *Evergestis insulalis* B. & McD. Goldstream.
5144. *Pyrausta perrubralis* Pack. Goldstream.

SCOPARIINÆ.

5245. *Scoparia torniplagalis* Dyar. Goldstream.

CRAMBINÆ.

5347. *Crambus bidens* Zell. Maillardville.
5349. *Crambus dissectus* Grt. Victoria.
5364. *Crambus innotatellus* Wlk. Maillardville.
5446. *Dicymolomia metalliferalis* Pack. Victoria; Goldstream.

PHYCITINÆ.

5615. *Meroptera unicolorella* Hulst. Maillardville.

PTEROPHORIDÆ.

5858. *Oxyptilus delawaricus* Zell. Maillardville.

GELECHIIDÆ.

Recurvaria nanella Hub. Victoria.

ŒCOPHORIDÆ.

Carcina quercana Fab. Victoria.

Eucosmidæ.

6790. *Bactra furfurana* Haw. Maillardville.
6821. *Argyroploce nimbatana* Clem. Victoria; Goldstream; Maillardville.
6836. *Argyroploce galaxana* Kearf. Goldstream.
6862. *Argyroploce instrutana* Clem. Victoria.
6867. *Argyroploce dealbana* Wlk. Victoria; Goldstream.
6931. *Eucosma rorana* Kearf. Victoria.
7009. *Eucosma johnsonana* Kearf. Victoria.
7010. *Eucosma hopkinsana* Kearf. Victoria.
7030. *Eucosma solandriana* Linn. Victoria; Goldstream.
7113. *Proteopteryx emarginana* Wlshm. Victoria.
7162. *Enarmonia plumbolineana* Kearf. Goldstream.
7170A. *Tmetocera ocellana* D. & S. race *lariciana* Hein. Victoria.
7263. *Hemimene britana* Busck. Victoria.

Tortricidæ.

7309. *Sparganothis inconditana* Wlshm. Victoria.
7313. *Sparganothis tunicana* Wlshm. Victoria; Goldstream.
7333. *Pandemis canadana* Kearf. Victoria; Goldstream.
Cacœcia hewittana Busck. Victoria.
Tortricodes fragariana Busck. Victoria.
7370. *Tortrix lomonana* Kearf. Victoria.
7374. *Tortrix peritana* Clem. Victoria; Goldstream.
Tortrix invidana B. & B. Victoria.
7416. *Peronea cervinana* Fern. Goldstream; Maillardville.
Peronea maximana B. & B. Goldstream; Maillardville.

Glyphipterygidæ.

7631. *Glyphipteryx bifasciata* Wlshm. Victoria.

Plutellidæ.

7639. *Euceratia castella* Wlshm. Victoria; Goldstream; Maillardville.
7641. *Abebæa subsylvella* Wlshm.. Victoria.

Yponomeutidæ.

7703. *Argyesthia conjugella* Zell. Victoria.

Haploptiliidæ.

7820. *Batrachedra præangusta* Haw. Victoria.

Gracilariidæ.

8048c. *Gracilaria alnivorella* Cham. race *sanguinella* Beut. Victoria.

Tineidæ.

8242. *Monopis crocicapitella* Clem. Victoria.

Rare and Uncommon Insects taken in British Columbia during 1920.

Notwithstanding the unfavourable climatic conditions during the past season, we are able to report more rare insects than we have in preceding years. Many collectors have sent in reports of their captures, accompanied in most cases with specimens for identification.

Victoria.—Mr. W. R. Carter took some interesting noctuids "at sugar" in the fall, which included *Euxoa obeliscoides* Gue.; *Agrotis ypsilon* Rott.; *Rhynchagrotis sambo* Sm.; *R. scopeops* Dyar; *Trachea cinefacta* Grt.; and *Eremobia claudens albertina* Hamp. A specimen of *Ipimorpha pleonectusa* Grt. was taken "at light," the first recorded for several years. The same collector picked up a dead specimen of *Oligia violacea* Grt. outside his house on August 21st. This was a most remarkable find, as it is the second specimen that we have any record of taken in British Columbia. The first one was captured at Clayoquot, on the west coast of

PLATE I.

SATURNIIDÆ AND NOCTUIDÆ.

Coloradia pandora Blake.
Victoria, B.C. (M. Brinkman).
(New to Canada.)

Oncocnemis hayesi Grt.
Kaslo, B.C. (J. W. Cockle).
(Very rare.)

Trachea separans Grt.
Maillardville, B.C. (L. E. Marmont).
(Very rare.)

Oncocnemis atrifasciata Morr.
Mount McLean, B.C. (A. W. Hanham).
(New to British Columbia.)

Eremobia claudens albertina Hamp.
Goldstream, B.C. (E. H. Blackmore).
(Uncommon.)

Oncocnemis barnesi Sm.
Trail, B.C. (W. H. Danby).
(Very rare.)

Hyppa brunneicrista Sm.
Kaslo, B.C. (J. W. Cockle).
(Rather rare.)

Acronycta strigulata Sm.
Lillooet, B.C. (A. W. A. Phair).
(New to British Columbia.)

Feralia columbiana Sm.
Vancouver, B.C. (R. V. Harvey).
(Not common.)

Feralia deceptiva McDun.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Schinia separata Grt.
Spences Bridge, B.C. (W. A. Newcombe).
(New to British Columbia.)

Vancouver Island, some eighteen years ago. Mr. A. L. Meugens took a beautiful specimen of *Polia restora* Sm.; this is a rather uncommon species. He also captured a specimen of *Autographa metallica* Grt., the second recorded from Victoria, the writer taking the first in 1918. Amongst the geometrids taken by Mr. Meugens was a series of *Nemora unilinearia* Tayl. "at light" and a single specimen of *Dysstroma ethela* Tayl. taken on June 24th. This is rather a rare geometer and is the first specimen taken in Victoria.

Amongst the geometrids taken by the writer during the season the following are of more than ordinary interest: *Dysstroma occidentata* Tayl. (uncommon); *D. sobria subumbrata* Swett. (the first specimen taken since the type specimens in 1915); *Hydriomena manzanita* Tayl. (rare in Victoria); *Entephria multivagata* Hulst. (first record for Vancouver Island); and *Nematocampa limbata* Haw. (uncommon).

Mount Newton.—This locality is about 15 miles north of Victoria on the Saanich Peninsula and attains an elevation of 700 feet. On August 1st, at the invitation of Mr. John Dean, who has an ideal place situated about half-way up the mountain, the writer spent the day collecting, and amongst many good things taken were *Dysstroma sobria ochrofuscaria* Swett. (the first for several years); *Enypia packardata* Tayl.; and *Nepytia umbrosaria nigrovenaria* Pack. (the first specimen that I have taken).

Goldstream.—The writer collected extensively in this locality during the season and obtained many good things, the following being of special interest: *Euxoa brunneigera* Grt. (very rare); *Agrotis esurialis* Grt. (uncommon); *Parastichtis puta dusca* Sm. (rare); *Chlorosea nevadaria* Pack.; *Lygris atrifasciata* Hulst (first record from Vancouver Island); *Dysstroma truncata* Hufn.; *D. sobria* Swett (the first specimen captured since the unique type was taken in 1914); *Phengommataea edwardsata* Hulst (first specimen I have taken and first record from this locality); *Cleora albescens* Hulst (first recorded capture since 1911; very rare, vide Rep. Prov. Mus. Nat. Hist., B.C., 1918); and *Cleora latipennis* Hulst (very uncommon).

Mr. H. McKnight, who resides at Goldstream, took a number of noctuids in September, feeding on hops. On the front verandah of his house a large hop-vine is trained, and after it gets dark the noctuids begin to arrive and with the aid of a lantern are readily bottled. The moths are not easily disturbed and seem reluctant to leave the hops. Amongst the noctuids taken by him the following are of interest: *Euxoa brocha* Morr. (not previously recorded from Goldstream); *Mythimna olivata* Harv. (uncommon); *Matuta apposita* Grt.; *Rhynchagrotis sambo* Sm. (uncommon); *Graptolitha patefacta* Wlk.; *G. ferrealis* Grt.; *Eremobia claudens albertina* Hamp. (rare); and *Gortyna pallescens* Sm. (a very worn specimen, but undoubtedly this species).

Departure Bay.—While on a collecting trip to this district last July, Mr. E. P. Van Duzee, of the Californian Academy of Sciences, San Francisco, took a beautiful specimen of that rare geometer *Caripeta aequalaria* Grt. at rest on the under-side of a leaf. He also took a fine specimen of *Synaxis jubararia* Hulst. This is rather a remarkable capture, as this geometer makes its appearance early in October as a rule—my earliest date being September 26th. Why it should be on the wing in July is a mystery.

Alberni.—Amongst a collection of Lepidoptera made by Mr. John Redford, a resident of the district, we note the following: *Gortyna pallescens* Sm. (the second specimen taken in this locality); *Autographa rectangula nargenta* Ottol. (uncommon); *Plusia aereoides* Grt. (uncommon); *Drepana bilineata levis* Hud. (rare); *Enypia packardata* Tayl.; *Nematocampa limbata* Haw. (uncommon); and *Evergestis straminalis* Hub.

New Westminster.—Mr. A. B. Baird, of the Dominion Entomological Branch, took several specimens of a medium-sized white moth which was identified by Dr. J. H. McDunnough, of Ottawa, as *Liparis salicis* Linn. (the satin-moth). This is a new moth to Canada and was probably imported on nursery stock from England. It feeds on Lombardy and other poplars and may turn out to be of economic importance. It is excessively abundant in England.

Maillardville.—Mr. L. E. Marmont, who collected persistently in this district in spite of the bad weather, took a number of very interesting insects, many of them rare and some of them new to the Lower Fraser Valley fauna. The following noctuids are worthy of more than passing mention: *Agrotis cynica perumbrosa* Dyar (previously known from Kaslo and Vernon); *Agrotis flavotincta* Sm. (uncommon); *Polia grandis* Bdv. (previously recorded from Kaslo); *P. nimbosa* Gue.; *Graptolitha thaxteri* Grt. (rare); *Trachea seperans* Grt. (previously known only from Windermere); *Acronycta minella* Dyar (known only from Kaslo and the Okanagan District); *A. innotata griscor* Dyar (not previously recorded from other than Kaslo, the nimotypical locality); *Arzama obliqua* Wlk. (rare), and *Panthea portlandia* Grt. (this specimen taken on earliest known date—i.e., April 14th; regular date of emergence is in July).

The geometrids taken included *Lygris harveyata* Tayl. (very rare); *Hydriomena renunciata columbiata* Taylor (uncommon); *Euphyia multiferata* Walk. (several specimens of this uncommon species taken at light); *Philobia ulsterata* Pears (Mr. Marmont reports this species common at light; it has previously been regarded as rather rare); and *Euchlæna tigrinaria sirenaria* Strecker (uncommon).

Hagensborg.—This locality is about 12 miles from Bella Coola and is in a very wet district. Mr. W. A. Sykes sent some material down that he had collected late in the season, but owing to the abnormal rainfall very little was taken. However, we were pleased to receive it, as scarcely any collecting has been done in this vicinity. The species received were: *Polygonia satyrus* Edw.; *P. faunus rusticus* Edw.; *Aglais J. album* B. & Le C.; *A. antiopa* Linn.; *Enargia citrata* Linn.; *D. citrata immanata* Haw.; *Ellopia somniaria* Hulst. (this record extends its known distribution); *Ennomos magnarius* Gue.; and *Synaxis jubararia* Hulst.

Lillooet.—Mr. A. W. Hanham, of Duncan, spent a week in this locality during the latter part of August. Most of his collecting was done on Mount McLean at altitudes varying from 3,000 to 6,500 feet. Some valuable material was taken, amongst which we note the following: *Argynnis hydaspe sakuntula* Skin. (a new locality for this form); *Euphydryas anicia* D. & H. (not previously known from here); *Plebeius scudderi* Edw. (known only from Atlin, vide Pro. B.C. Ent. Soc., No. 14, page 7, 1919); *Lasionycta sedilis* Sm. (previously known from Kaslo only); *Oncocnemis atrifasciata* Morr. (new to British Columbia); *Carsia paludata* Thun. (rare); *Itame epigenata* B. & McD. (new to British Columbia); *Pyla rainierella* Dyar (Mount Cheam only previous record); *Eucosma stygiana* Dyar (rare); and *Hepialus pulcher macglashani* Hy. Edw. (very local—we have no other record than Mount McLean). Mr. A. W. Phair has also taken it.

Amongst some material sent to us for identification by Mr. Phair the following are of special interest: *Euxoa andera* Sm. (rare and a new locality); *E. quinquelinea* Sm. (rare); *Septis barnesi* Sm. (not previously known from here); *Acronycta strigulata* Sm. (new to British Columbia); *A. mocsta* Dyar (uncommon); *Andropolia theodori epichysis* Grt. (uncommon); *Catocala nevadensis montana* Beut. (rare); and *Eosphoropteryx thyatiroides* Gue. (very rare).

Enderby.—Mr. J. Wynne, who resides in this district, reports the capture of *Polia assimilis pulverulenta* Sm. and *Cirphis commoides* Gue. Both are good records. The former adds to our knowledge of the distribution of this rather rare noctuid, as our previous records are from widely distant localities—viz., Vancouver Island, Northern British Columbia (Taku River), and Kaslo. The latter (*commoides*) is also rare, our only records being from Kaslo and Penticton.

Kaslo.—A long list of captures has been sent in by Mr. J. W. Cockle, one of the oldest and most enthusiastic entomologists in British Columbia. The following are of special interest: *Aplectoides occidens* Hamp. (very rare); *Perigrapha achsha* Dyar (rare); *Platyperigea anotha* Dyar (rare); *Arzama obliqua* Wlk. (uncommon); *Panthea portlandia* Grt. (the third specimen taken in this district); *Autographa orophila* Hamp. (rare); *A. flagellum* Wlk. (second specimen taken at Kaslo); *A. sansoni* Dod (new to British Columbia); *Eupithecia tenuata* Hulst. (uncommon); *Macaria purcellata* Tayl. (rare); *Caripeta angustiorata* Wlk. (new to British Columbia); *Cleora satisfacta* B. & McD. (rare); *Gabriola dyari* Tayl. (rare in this district until this season, when Mr. Cockle captured five males and one female); and *Erannis vancouverensis* Hulst. (rare—one male taken, the first specimen taken since 1904).

Elko.—Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, while on an inspection trip in this district took a short series of *Itame occiduaria* Pack. This geometer is rather rare in British Columbia collections, as it evidently is a Rocky Mountain species, our previous record being Cranbrook.

Sheep Creek, Kootenay-Columbia Valley. A nice series of *Eurymus alexandra emilia* Edw. was taken by Mr. Anderson in the latter part of July. He also took a specimen each of *Lygris atrifasciata* Hulst. and *Euchlaena astylusaria* Wlk. Mr. Anderson, whose duties take him over a large portion of the Province, reports that climatic conditions were bad in most localities and insect-collecting poor.

PLATE II

GEOMETRIDÆ

Lobophora simsata Swett.
(Male paratype.)
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Carsia paludata Thun.
Mount McLean, B.C. (A. W. Hanham).
(Rare.)

Drepanulatrix quadraria Grt.
(Male.)
Mount McLean, B.C. (G. O. Day).
(New to British Columbia.)

Drepanulatrix quadraria Grt.
(Female.)
Mount McLean, B.C. (G. O. Day).
(New to British Columbia.)

Itame epigenata B. & McD.
Mount McLean, B.C. (A. W. Hanham).
(New to British Columbia.)

Marmopteryx marmorata Pack.
(Under-side.)
Vaseaux Lake, B.C. (W. B. Anderson).
(Local.)

Metarranthis septentrionaria B. & McD.
Lillooet, B.C. (W. B. Anderson).
(New to British Columbia.)

Cleora satisfacta B. & McD.
Kaslo, B.C. (J. W. Cockle).
(Local.)

MICROLEPIDOPTERA.

Tortrix inridana B. & B.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Scoparia torniplagalis Dyar.
Goldstream, B.C. (E. H. Blackmore).
(New to British Columbia.)

Carcina quercana Fab.
Victoria, B.C. (E. H. Blackmore).
(New to North America.)

Sparganothis tunicana Wlshm.
Goldstream, B.C. (E. H. Blackmore).
(New to British Columbia.)

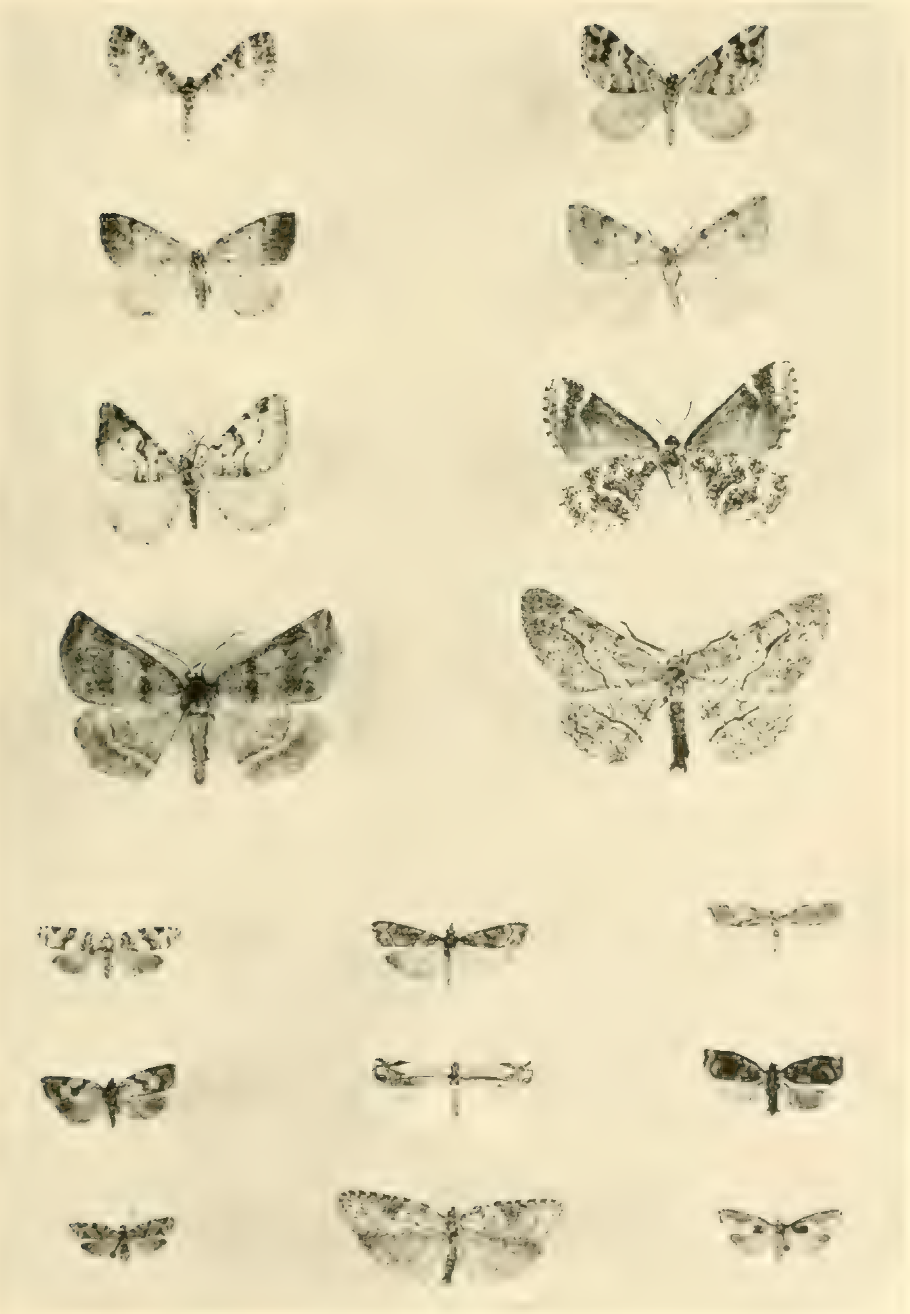
Crambus bidens Zell.
Maillardville, B.C. (L. E. Marmont).
(New to British Columbia.)

Cacœcia hewittana Busck.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Eucosma hopkinsana Kearf.
Victoria, B.C. (W. R. Carter).
(New to British Columbia.)

Peronea maximana B. & B.
Maillardville, B.C. (L. E. Marmont).
(New to science.)

Eucosma johnsonana Kearf.
Victoria, B.C. (W. R. Carter).
(Rather rare.)



New British Columbia Insects.

The following seventeen insects from British Columbia have been described as new to science during the year 1920. They comprise twelve species of Lepidoptera, one species of Coleoptera, two species of Hymenoptera (Parasitic), and two species of Diptera.

Lepidoptera.

Of the twelve species of Lepidoptera, two belong to the family Noctuidæ, one to the Lasiocampidæ, five to the Geometriadæ, one to the Pyralidæ, and three to the Tortricidæ. They are as follows:—

Noctuidæ.

Feralia deceptiva McDunnough. Described in the Can. Ent., Vol. 52, page 165, June and July, 1920, from two male specimens taken at Vancouver. This species had been previously associated with *Feralia columbiana* Smith. Further notes on both species will be found under the heading of "Illustrated Lepidoptera," with illustrations of both of them on Plate I.

Cœnurgia erechtea Cram. form *parva* Blackmore. Described in Can. Ent., Vol. 52, page 226, Dec. 1920, from specimens of both sexes taken by the writer at Victoria.

Lasiocampidæ.

Tolype dayi Blackmore. Described in Can. Ent., Vol. 52, page 226, from seven specimens taken on Vancouver Island—Quamichan Lake (G. O. Day); Sluggett's (W. Downes); Victoria (E. H. Blackmore).

Geometridæ.

Lobophora simsata Swett. Described in The Lepidopterist, Vol. 3, page 123, Feb., 1920, from fourteen specimens taken by the writer at Victoria. A figure of this species will be found on Plate II. and more extended remarks upon it under the heading of "Illustrated Lepidoptera."

Eustroma nubilata Pack. form *macdunnoughi*, Blackmore. Described in Can. Ent., Vol. 52, page 267, Dec., 1920, from twelve specimens taken on Vancouver Island and the Lower Fraser Valley—Duncan (E. M. Skinner); Vancouver (R. V. Harvey); Fraser Mills (L. E. Marmont); Chilliwack (W. B. Anderson); Goldstream, Vancouver, Cloverdale, Rosedale (E. H. Blackmore).

Dysstroma sobria Swett form *swetti* Blackmore. Described in Can. Ent., Vol. 52, page 268, Dec., 1920, from ten specimens taken by the writer at Victoria. This large and handsome geometer was figured under the name of *mullcolata* Hulst in Rep. B.C. Prov. Mus. Nat. Hist., 1916, Plate VIII. In the light of later research *mullcolata* is considered to be the smaller white-banded form, which is in some years very abundant on Vancouver Island in the month of August; *swetti* occurs in normal years in mid-June and is rather uncommon.

Anthorhöe incursata Hub. race *lagganata* Swett & Cassino. Described in The Lepidopterist, Vol. 3, page 131, Feb., 1920, from two specimens taken by the late F. H. Wolley Dod. The male holotype was taken at Laggan, Alberta, and the female allotype at Field, B.C., on July 3rd, 1907.

Eulype albodecorata Blackmore. Described in Can. Ent., Vol. 52, page 269, Dec., 1920, from a long series of both sexes taken by the writer at Goldstream, B.C. This species is apparently distinct from *hastata* Linn., with which it flies, the latter, however, being from a week to ten days later putting in an appearance. In a long series of both species I have not known them to intergrade, although they are subject to a certain amount of variation within certain limits. On the other hand, *gothicata* Gue., which occurs sparingly at various points on the Mainland, shows considerable intergradation with *hastata*. Until these various forms are bred from the egg to the imago our proper understanding of this group will remain incomplete.

Pyralidæ (Pyralinæ).

Herculia florenccalis Blackmore. Described in Can. Ent., Vol. 52, page 270, Dec., 1920, from a single female taken by the late W. H. Danby at Rossland, B.C.

Tortricidæ.

The following three species were described by Messrs. Barnes & Busck in Cont. Lepid. No. Amer., Vol. IV., No. 3, page 215 *et seq.*, March, 1920:—

Tortrix dimorphana Barnes & Busck. Described from specimens taken at Duncan, B.C. (A. W. Hanham), and Victoria, B.C. (collector's name not given).

Tortrix invidana Barnes & Busck. Described from specimens taken at Duncan, B.C. (A. W. Hanham), and Victoria, B.C. (collector's name not given). During the past season the writer was fortunate in capturing four specimens of this new species, one of which is figured on Plate II.

Peronea maximana Barnes & Busck. Described from specimens taken at Duncan, B.C. (A. W. Hanham), and Victoria, B.C. (A. J. Croker). The writer has also taken this species at Goldstream, and Mr. L. E. Marmont took a nice series at Maillardville, B.C., one of these being figured on Plate II.

Coleoptera.

Aphodius canadensis Garnett. Described in Can. Ent., Vol. 52, page 139, June and July, 1920, from six specimens taken by Mr. C. B. Garrett at Cranbrook, B.C. (five), and Crowsnest, B.C. (one). This species is a small shiny black beetle about a quarter of an inch in length and belongs to the family Scarabidæ.

Hymenoptera (Parasitic).

Arotes maurus Rohwer. Described in Pro. U.S. Nat. Mus., Vol. 57, page 517, 1920, from two females taken at Mission, B.C. (collector's name not mentioned). This species belongs to the tribe *Acocnitini* of the family Ichneumonidæ. This new species of ichneumon-fly measures about three-quarters of an inch in length, with slightly yellowish hyaline wings with dark-brown veins.

Platycampus victoria MacGillivray. Described in Can. Ent., Vol. 52, page 59, March, 1920, from specimens bred by Mr. W. Downes at Victoria, B.C. This is the adult of the orange and black larvæ which are so destructive to the Lombardy poplar in Victoria during September. Reference was made by the writer in Rep. Prov. Mus. Nat. Hist., B.C., 1917, page 9, to a particularly bad infestation during that year. As the larvæ are so well known to the average Victorian, a short description of the adult insect taken from specimens bred by the writer several years ago may prove of interest. Head and thorax glossy black; body deep yellow, with two pairs of transparent, iridescent wings. On the front margin of the first pair of wings, two-thirds out from the body, is a blackish mark called the stigma. The antennæ or feelers are yellowish in the male and blackish in the female; the three pairs of legs are yellow. It measures about a third of an inch in length and four-fifths of an inch from tip to tip of the wings when spread out. My bred specimens emerged in the first week of June. This species belongs to the family Tenthredinidæ. They are popularly known as sawflies from the fact that the abdomen of the female is furnished with a pair of saws which can be pushed out and moved up and down. They are used for making slits in leaves or other vegetable tissue in which the eggs are laid.

Diptera.

Melina palustris Melander. Described in the Annals Ent. Socy. Amer., Vol. 13, page 316, Sept., 1920, from over 100 specimens ranging over a wide territory, including Idaho, Wyoming, Montana, Washington, and British Columbia. The specific locality in British Columbia is Nelson, where the specimens were collected by Mr. Melander. This is a small fly measuring about a fifth of an inch in length, with hyaline wings, a blackish body, and a greyish thorax. The flies belonging to this family are generally found on the borders of streams and in marshy places.

Euparyphus pretiosa Banks. Described in Can. Ent., Vol. 52, page 65, March, 1920, from a single female taken at Vancouver, but the name of the collector is not stated.

ILLUSTRATED LEPIDOPTERA.

Under this heading we hope to continue to illustrate species which have been recently described from British Columbia; those of rare and uncommon occurrence and those which have been confused with other species. Many of the species are here illustrated for the first time.

We have not illustrated in this report the six species described by the writer in Can. Ent., Vol. 52, page 266 *et seq.*, Dec., 1920, as an excellent plate accompanied the above article figuring each of the species described.

The number appearing before each name corresponds with a similar number in Messrs. Barnes and McDunnough's Check-list of North American Lepidoptera, 1917. Those with an asterisk prefixed to them have been described since the above "List" was issued.

Saturniidæ (Plate I).

782. ***Coloradia pandora*** Blake. This is rather a remarkable capture, as it is, I believe, the first record in Canada of this southern species. This specimen was taken by Mr. M. Brinkman in the early morning of July 18th at rest on the ground beneath an electric-light pole in Victoria West. It is a male and is in fine condition, with the exception of the scaling on the veins in the median area of the primaries, which is a little rubbed. The fore wings are brown in colour, with the extra discal line and the basal area of a darker brown; the transverse lines are edged with grey. The hind wings are somewhat translucent, with a dark extra-discal line and a dusky sub-marginal band. The inner margin is of a distinctly rosy hue. The antennæ are pale yellow, heavily pectinated, with the pectinations strongly curved, which is a characteristic of this group. There is a large round solid black dot on each wing.

This species belongs to the family Saturniidæ and is closely allied to *Pseudohazis eglanterina* Bdv. (the sheep-moth). It is an inhabitant of Colorado and has also been recorded from Nebraska, Arizona, and New Mexico, and in some years it is reported as being very common at Fort Klamath, in Southern Oregon. As the particular part of Victoria West in which it was captured is adjacent to a railway-yard where " foreign " cars stand until unloaded, it is reasonable to suppose that this specimen came in its pupal state in one of these cars and emerged upon or soon after its arrival here.

Noctuidæ (Plate I).

1160. ***Schinia separata*** Grt. This exceedingly pretty noctuid was taken by Mr. W. A. Newcombe at Spences Bridge on August 19th, 1919. This is the first record of this species in British Columbia and is also the first representative of the genus known to occur here. The genus *Schinia* contains a large number of species, most of them small and rather pretty. They are particularly abundant in the South-western States. Dr. J. B. Smith (Trans. Am. Ent. Soc., Vol. X., page 229, 1883) made *separata* a synonym of *acutilinea* Grt., but more recently it has been raised to its former status as a separate species. The ground colour of *separata* is light fawn marked with darker shades of the same colour, with the transverse lines white, narrowly edged with black. *Acutilinea* is a darker insect with the transverse lines more emphasized.

2018. ***Oncocnemis haysei*** Grt. This is rather a rare insect, as, in fact, are all the species of this genus in this Province, with the possible exception of *O. chandleri* Grt. The localities given in "Dyar's List" (Bull. 52, U.S.N.M.) are Colorado, California, and British Columbia. As far as our records show, Kaslo is the only locality in the Province in which it has been taken. The specimen figured was taken by Mr. J. W. Cockle in August, 1913.

2061. ***Oncocnemis atrifasciata*** Morr. This is another new record for British Columbia and was taken by Mr. A. W. Hanham on Mount McLean, near Lillooet, B.C., at an altitude of 4,000 feet. It is an inhabitant of the Atlantic States, but has been taken in Manitoba and Alberta. It differs somewhat from Manitoban specimens in the dark-grey colour of the primaries and in the collar being tipped with white. It is also a trifle larger, and when a series can be secured it may prove to be a good geographical race. The date of capture was August 20th, 1920.

2062. ***Oncocnemis barnesi*** Smith. This striking species was described from Wyoming in Jour. N.Y. Ent. Soc., Vol. VII., page 37. It is exceedingly rare, the specimen figured being taken by the late Mr. W. H. Danby at Trail on June 30th, 1900. Mr. Cockle, of Kaslo, has also taken a specimen. The primaries are of a beautiful dove-grey, crossed by two distinct black lines, the veins on the outer margin being narrowly outlined in black.

2098a. ***Feralia columbiana.*** This species was described in Can. Ent., Vol. 35, page 9, Jan., 1903, from two males, one of which was taken at New Westminster by Dr. Fletcher in 1896. It is a most beautiful insect, the ground colour being a bright blue-green with heavy, black markings, some of which are edged with white. The specimen illustrated was taken by the late Captain R. V. Harvey at Vancouver on April 30th, 1904. It has also been taken sparingly at Victoria, Duncan, and Wellington, and recently I have identified a specimen from Mr. Cockle, of Kaslo, as this species.

* ***Feralia deceptiva*** McDunnough. Described in Can. Ent., Vol. 52, page 162, June and July, 1920, from two males taken at Vancouver by the late Arthur Bush. This is very close to the preceding species and is the same in coloration, but the maculation of the primaries is different, while the secondaries are darker, being wholly smoky-brown. A reference to the figures will show the differences between the two species.

This newly described species has also been taken at Victoria and Duncan, and is probably the same insect that was listed in the 1906 B.C. Check-list as *Momophana comstocki* Grt. They are closely related, but the latter is only known from the Atlantic States.

2288. *Trachea separans* Grt. This is a most remarkable capture, as the only previously recorded locality for this species in British Columbia is Windermere, in the foot-hills of the Rockies. It was recorded under the name of *ferens* Sm. by the late Wolley Dod in the Bull. B.C. Ent. Soc., April, 1908; *ferens* has now been made a synonym of *separans*. The specimen figured was taken by Mr. L. E. Marmont at Maillardville on July 10th, 1920.

2359A. *Eremobia claudens albertina* Hamp. In Cont. Lepid. No. Amer., B. & McD., Vol. II., No. 1, Plate XIII., Fig. 4, is illustrated a specimen of *albertina* from Duncan, V.I. In the latter part of May, while studying the splendid collection of noctuids belonging to Mr. G. O. Day, of Duncan, the writer recognized several specimens of this rather rare noctuid from the above-mentioned figure. A day of two later I found two or three more specimens in the collection of Mr. A. W. Hanham, which were taken in the same district. Strange to say, the species turned up in Victoria this season, Mr. W. R. Carter securing a specimen "at sugar" on August 21st. The writer also took a specimen in good condition at Goldstream "at light" on September 7th, and Mr. H. McKnight, of Goldstream, took another on September 26th, the latter, however, being rather worn.

2458. *Acronycta strigulata* Sm. This species is a new record for British Columbia and was taken by Mr. A. W. A. Phair, of Lillooet, B.C., on July 27th, 1920. It is interesting to note in this respect that, while Mr. Phair is an extremely busy man and does not find much time for collecting, he always manages to take each season one or more species new to the Province. The specimen is not in the best of condition, but we are glad to figure it as a new record. The species was originally described from Colorado (Ent. News, Vol. VIII., page 150, 1897).

2532. *Hyppa brunneicrista* Sm. The specimen figured was taken by Mr. J. W. Cockle, of Kaslo, on June 1st, 1914. We are very glad to have seen this specimen and to be able to figure it, as it has cleared up all doubts as to its presence in British Columbia.

In the 1906 Check-list both *brunneicrista* and *xylinoides* were listed from Wellington, Vancouver, and Kaslo. In Bull. B.C. Ent. Soc. No. 9, April, 1908, Wolley Dod states: "I believe this record (*brunneicrista*) to be entirely erroneous. The species I saw rather commonly in British Columbia collections under this name is the Pacific Coast form of *xylinoides* Grt." In a continuation of the same article (*Ibid.* No. 10, June, 1908), and under the heading of *Hyppa indistincta* Sm., he says: "Dr. Dyar records this from Kaslo, but I believe him to be wrong in referring *brunneicrista* Sm. to the synonymy. I have a specimen from Kaslo and took one at Laggan last July which agree with the figure and description of *indistincta*, and are, in my opinion, distinct from *brunneicrista*."

Recently Mr. Cockle has sent us specimens of all three species for examination, and while *indistincta* and *xylinoides* are close to each other, *brunneicrista* is abundantly distinct from both of them. It may be easily separated by the following characters: (*a*) The pectinations of the male antennæ are longer than in the other species; (*b*) the thorax laterally is solid reddish-brown; (*c*) the posterior thoracic tuft is distinctly rusty-brown; (*d*) a rusty-brown streak in the s.t. space near the anal angle. The general appearance of the insect also seems much darker.

Geometridæ (Plate II).

3939. *Marmopteryx marmorata* Pack. Mr. W. B. Anderson was fortunate enough to secure several specimens of this fine geometer at Vaseaux Lake, B.C., on May 25th, 1920. They had evidently newly emerged and were in perfect condition. A figure of the under-side is given to show the beautiful marbled effect on the hind wings. The ground colour is white with reddish-brown and dark-brown markings. A reference to this species was made in the Rep. Prov. Mus. Nat. Hist., B.C., page 18, 1919.

3945. *Carsia paludata* Thun. This species is one of the rarest geometers that we have and is a high-altitude species. The first record that we had of this species was a specimen taken by the late Mr. R. V. Harvey on the Hope Mountains on July 19th, 1906. No further record was obtained until last year, when amongst some geometrids sent to the writer for determination by Mr. J. W. Cockle, of Kaslo, another specimen of this species was found. Mr. A. W. Hanham, while collecting on Mount McLean last August at an altitude of 6,500 feet, captured several specimens, one of which we figure.

* *Lobophora simsata* Swett. This new species was described from a long series taken by the writer between May 5th and 10th, 1918. During the six years previous to that date the writer had only taken odd specimens; i.e., one in 1913, one in 1914, two in 1916, and four in 1917, all of which were taken in the suburbs of Victoria. Three of those taken in the latter year were brought to me by Mr. A. Robinson, who stated that he had taken them at rest on the side of his house. The following spring I asked him to keep a good look-out for them, and one day in early May he informed me that there were a number of small moths flying at sundown on a vacant lot adjoining his house which appeared to be the species that I wanted. Upon going over there the following evening I found to my great delight that this was the case, and, although a cool wind was blowing, I managed to net sixteen specimens. The weather conditions were not very favourable during the next few evenings, but with hard work and a great amount of beating nearly forty specimens were taken between us. Owing probably to the extreme wet weather, none were seen in 1919. That winter the ground was cleared and ploughed over for cultivation and I have not seen a specimen since.

4326. *Drepanulatrix quadraria* Grt. This is a new record for British Columbia and was taken by Mr. G. O. Day while on a collecting-trip at Lillooet in July, 1919. It was described in Can. Ent., Vol. XIV., page 185, 1882, and the localities given for it are California, Colorado, and Nevada. The sexes are dissimilar and we have figured a specimen of each.

* *Itame epigenata* B. & McD. This species was described from Truckee, Calif., in Cont. Lepid. No. Amer., Vol. III., No. 4, page 238, March, 1917. The specimen figured was taken by Mr. A. W. Hanham in August last on Mount McLean at an altitude of 6,000 feet and is a new addition to our list.

It also occurs at Kaslo, as the writer has recently seen a specimen taken by Mr. Cockle which agrees very well with the Lillooet specimen. This is probably the same species as Dr. Dyar records (Lepid. Koot. Dist., 1904) under the name of *bitactata* Wlk. from Sandon (one) and Kaslo (one). The two species are closely allied, but it is more reasonable to suppose that *epigenata* would extend its range northward from California than that *bitactata* would extend westward and cross the Rocky Mountains.

Cleora satisfacta B. & McD. This is also a new addition to our list, having been described (Cont. Lepid. No. Amer., Vol. III., No. 4, page 244, March, 1917) from a pair taken by Mr. Cockle at Kaslo, B.C. This is a rather rare geometer at Kaslo and very few specimens have been taken until this season, when Mr. Cockle had the good fortune to secure three of them. We are glad to be able to figure this species, as we have previously figured the other two British Columbia species of this group; i.e., *excelsaria* Streck, Rep. Prov. Mus., 1917, Plate II., and *albescens* Hulst., *ibid.*, 1918, Plate II.

Dr. J. H. McDunnough has recently revised the whole of the genus *Cleora* (Studies in North American Cleorini, Bull. 18 (Tech.), Dept. Agric., Ottawa, No. V., 1920) and has erected many new genera, including *Stenoporpia*, which receives the three above-mentioned species.

Metarranthis septentrionaria B. & McD. This species was described in Cont. Lepid. No. Amer., Vol. III., No. 4, page 257, March, 1917, from specimens taken at various points in Manitoba. The specimen illustrated was taken by Mr. W. B. Anderson at Lillooet on May 19th, 1918. It is closely allied to *duaria* Gue., but is separated from that well-known species by the ruddy-brown shading on the median area, which causes the latter to stand out as a dark band. There are also differences in the course of the extra and intra-discal lines.

The genus *Gonodontis* has been separated into two groups on account of the differences in the male genitalia, *duaria* and its allies being placed in Warren's genus *Metarranthis*.

Microlepidoptera (Plate II).

5245. *Scoparia torniplagalis* Dyar. This rather well-marked scoparid was taken by the writer at Goldstream on August 12th. It is a new accession to the list and must be somewhat rare, as out of a large number of specimens of this genus taken during the past season only three proved to be of this species.

Carcina quercana Fabr. This is rather a remarkable capture, as it is a new record for North America. It is fairly common in some parts of England and has an extended distribution throughout Europe, but has never before been recorded from any part of North America. The writer was fortunate in securing seven specimens during the past season, the dates being as follows: July 16th (one); July 29th (two); August 4th (one); August 10th (two); and August 12th (one). Strange to relate, six of the seven specimens were taken in my own garden.

It is a very pretty moth, the ground colour of the primaries being of a dull pink, with an oblong yellow patch on the costa, and the long fringe of the outer margin is also yellow. It belongs to the family Œcophoridæ. In a recent letter Mr. A. Busck, of the United States National Museum, states that we should find the larva spinning a flat web on the under-side of oak, apple, or willow.

5347. *Crambus bidens* Zell. This is an unexpected record, as its habitat is Eastern Canada and the New England States. A nice series of this pretty crambid was taken by Mr. L. E. Marmont at Maillardville. It was on the wing from the end of July until the middle of August, but was extremely local. It is very closely allied to *pascuellus* Linn., with which species it is liable to be confused.

7009. *Eucosma johnsonana* Kearf. This exceedingly pretty species was described in Trans. Am. Ent. Soc., Vol. 33, page 36, Jan., 1907, from five specimens, which included a female from Victoria (Rev. G. W. Taylor) and a male from Vancouver Island. According to Mr. Busck this species is rather rare in collections. Mr. W. R. Carter, however, secured three nice specimens during the past season, the best of which, taken on July 29th, is figured.

When in good condition it is a very pretty insect, presenting a rosy-pink appearance. The upper portion of the primaries are salmon-pink, with the lower half of the basal area a deep rose-pink, bordered by a narrow band of blackish scales.

7010. *Eucosma hopkinsana* Kearf. This is another of Mr. Carter's captures and is apparently new to British Columbia. It was described (*ibid.*, page 37) from two specimens taken at Hoquiam, Wash. Four specimens were taken by Mr. Carter during August, one of which is illustrated. The primaries are of a light green, marked with lines and shades of black and fuscous.

7313. *Sparganothis tunicana* Wlshm. A short series of this pretty brown and yellow tortricid was taken by the writer at Victoria and Goldstream during July and August. Mr. Busck considers this species to be an extreme variety of the immaculate *inconditana* Wlshm. Two specimens of the latter were also taken by me at Victoria in July last.

* *Cacœcia hewittana* Busck. This species was described in Can. Ent., Vol. 52, page 125, June and July, 1920, by August Busck from a large series bred from raspberry at Sydney, Nova Scotia. It is evidently a general feeder, as the writer bred a long series from larvæ feeding on apple, pear, cherry, and laurel. The adults began to emerge on July 4th and continued doing so until about the 15th. They are very variable in the coloration of the fore wings, the ground colour ranging from light ochreous, reddish ochreous, to fawn and dark brown.

It is rather surprising to see this species here in such numbers and it evidently has a wide distribution. Mr. Busck informs me that he also has the species from Toronto.

* *Tortrix invidana* Barnes & Busck. The writer took several specimens of this new species in August and September, one of which proved to be a male. This is the first male recorded, the type specimens being all females. The ground colour is sordid white, with grey bands and markings edged narrowly with black. It is rather uncommon.

* *Peronea maximana* Barnes & Busck. This is one of the largest of our British Columbia tortricids and is rather a handsome moth. Mr. Marmont took a long series at Maillardville from the middle of September and extending away on into October. The ground colour varies from a very light grey to dark grey, with a series of reddish-brown markings on the costal edge of the fore wing. The amount of reddish-brown scaling is also very variable, some of the specimens having comparatively little, while others are heavily strigulated. Mr. Marmont's specimens were all taken at rest in a grove of second-growth alders a short distance away from his home, and this is probably their food-plant.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1921.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1921

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
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To His Honour WALTER CAMERON NICHOL,

Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History for the year 1921.

J. D. MACLEAN,
Provincial Secretary.

Provincial Secretary's Office,
Victoria, February, 1922.

Provincial Museum of Natural History,
Victoria, B.C., February 1st, 1922.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1921, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

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REPORT *of the*

PROVINCIAL MUSEUM OF NATURAL HISTORY

FOR THE YEAR 1921.

By Francis Kermode, Director.

OBJECTS.

(*a*.) To secure and preserve specimens illustrating the natural history of the Province.

(*b*.) To collect anthropological material relating to the aboriginal races of the Province.

(*c*.) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and diffuse knowledge regarding the same.

ADMISSION.

The Provincial Museum is open, free, to the public daily throughout the year from 9 a.m. to 5 p.m. (except New Year's Day, Good Friday, and Christmas Day); it is also open on Sunday afternoons from 1 p.m. to 5 p.m. from May 1st until the end of October.

VISITORS.

The actual number of visitors whose names are recorded on the register of the Museum is 22,550. This does not include Mr. and Mrs. and very often several members of a family; teachers and their classes whose attendance has increased materially during the last year in connection with their nature-studies; and it must be understood that these figures do not include Asiatics and others. The following figures will give some idea of those who recorded their names during the months of: January, 1,245; February, 1,567; March, 1,413; April, 1,221; May, 1,604; June, 1,876; July, 4,022; August, 4,614; September, 2,061; October, 1,347; November, 864; December, 716.

ACTIVITIES.

The Public Works Department, having completed the excavation of the basement of the Museum, carried on the work so as to put this portion of the building into shape for exhibition-rooms for anthropology. The floors have been cemented throughout, the walls all plastered, and windows had to be put in through the basement walls so as to give light and air. The Public Works Department also carried on its extensive work in regard to renewing the electric-light system and have it divided into sections, so that it is only necessary to use portions of the lighting system at times, thus practising economy to a great extent.

Since the Public Works Department has finished the alterations, the Director is now in a position to carry out the long-needed want of arranging the valuable anthropological material which has been stored for a number of years. This material has been transferred from the temporary building to the basement of the Museum, and is now practically safe from all danger of fire. All the anthropological exhibition which is now on the first floor of the Museum will be transferred to the basement, so as to arrange all the exhibition of this material according to the different tribes of Indians of this Province. The arrangement will be similar to that which was carried out in the exhibition on the first floor; that is, according to house and house furniture, implements of war and the chase, etc.

A carpenter has been employed for several months making cases for this material; the staff is now busily engaged in arranging the collection for exhibition, and it is hoped to have the exhibition halls of anthropology open to the public not later than May 1st.

The study series of mammals and birds, which were also stored in a temporary building, have now been removed to the study-room on the main floor of the Museum and are available to those visitors who wish to consult them.

A List of "The Flora of Vancouver and Queen Charlotte Islands" has been issued from the press and is now available to those students who are interested in botany, and no doubt will be quite a help in giving the distribution of the flora of Vancouver Island. We know that this list is to a great extent not complete, and hope that it will be the means whereby students will aid the Provincial collections by gathering material that is not represented in the collections from some of the most outlying portions of Vancouver and Queen Charlotte Islands. In this way we will be able to get a more definite distribution of our Coast flora. Persons requiring the list are requested to make application to the Provincial Museum for the same. Additions and corrections to "The Flora of Vancouver and Queen Charlotte Islands" will be published from time to time in the Annual Reports of the Provincial Museum.

LOAN COLLECTION OF LEPIDOPTERA.

Mr. Frank Williamson in July, 1921, loaned to the Provincial Museum a wonderful collection of tropical Lepidoptera. These represented specimens from India, Australia, Ceylon, South America, Africa, Japan, Europe, and other countries. Mr. Williamson has been studying the Lepidoptera of the world for a number of years with regard to the similarity of species and geographic range, and this was the finest collection of butterflies and moths from different parts of the world that has ever been placed on exhibition in British Columbia. There were 196 specimens all beautifully mounted in Riker mounts, and it filled two large cases on the second floor of the Museum.

Although the Provincial Museum is a museum for the exhibition of the flora and fauna of British Columbia, when this collection was offered by Mr. Williamson as a loan, the Honourable Dr. J. D. MacLean, Provincial Secretary, readily granted permission to have the same put on exhibition. They were admired by thousands of visitors, numbers of them making a special visit to the Museum to see this wonderful display. Others came and made drawings and paintings for their own private collections. These specimens were returned to Mr. Williamson at the end of the calendar year.

MAMMALS.

Mr. E. W. Nelson, Chief of the Biological Survey, United States Department of Agriculture, Washington, D.C., asked that the study series of the chipmunks in the Provincial Museum be loaned to their Department, as Mr. A. H. Howell, a specialist, was working on this group. Seventy-eight skins from different districts on the Mainland of British Columbia were sent for study. The Department at Washington greatly appreciated the loan of these specimens, which proved of great service to Mr. Howell in his study of this group. Upon returning the specimens he wrote his identification on the labels.

The following is a list of the species and subspecies determined by Mr. Howell's examination of these skins. It is very much in evidence that intergrading among the species and subspecies to a very pronounced extent is taking place throughout the geographic range, as the following classification according to the species in the Province will show:—

Eutamias townsendi Bachm. Type locality, mouth of Columbia River. Geographical distribution, Coast region of Oregon, Washington, and British Columbia, from mouth of Columbia River northward, east in northern Cascades to head of Lake Chelan.

Eutamias amœnus felix Rhoads. Type locality, Mount Baker Range, Westminster District, British Columbia. Geographical distribution, Mount Baker Range, British Columbia; extent unknown.

Eutamias amœnus luteiventris Allen. Type locality, Chief Mountain Lake, Montana. Geographical distribution, Rocky Mountains in Montana from Helena northward into British America. Specimens examined: Okanagan, B.C., 9; Shuswap, B.C., 2; Cranbrook, B.C., 2.

Eutamias amœnus affinis Allen. Type locality, Ashcroft, British Columbia. Geographical distribution, Interior of British Columbia, east of the Cascade Mountains. Specimens examined: Okanagan, B.C., 18; Grande Prairie, B.C., 2; Similkameen, B.C., 9.

Eutamias amœnus ludibundus. Specimens examined: Moose Lake, B.C., 4; Lillooet, B.C., 8.

Eutamias amœnus affinis x *luteiventris.* Specimens examined: Okanagan, B.C., 3.

Eutamias amœnus luteiventris x *affinis.* Specimens examined: Okanagan, B.C., 6.

Eutamias amœnus affinis x *ludibundus.* Specimens examined: Similkameen, B.C., 1.

Eutamias amœnus ludibundus x *affinis.* Specimens examined: Lillooet, B.C., 1.

Eutamias minimus caniceps. Specimens examined: Atlin, B.C., 10.

Five black skins from near the headwaters of the Stikine River, two of which have been provisionally identified by Dr. C. Hart-Merriam as melanistic examples of *Eutamias borealis caniceps* in 1909. The other three specimens were sent to the Museum in 1918 by Mr. H. W. Dodd, Government Agent at Telegraph Creek. These three chipmunks were taken by an Indian on Groundhog Mountain, who states that in this particular locality the chipmunks are all black and

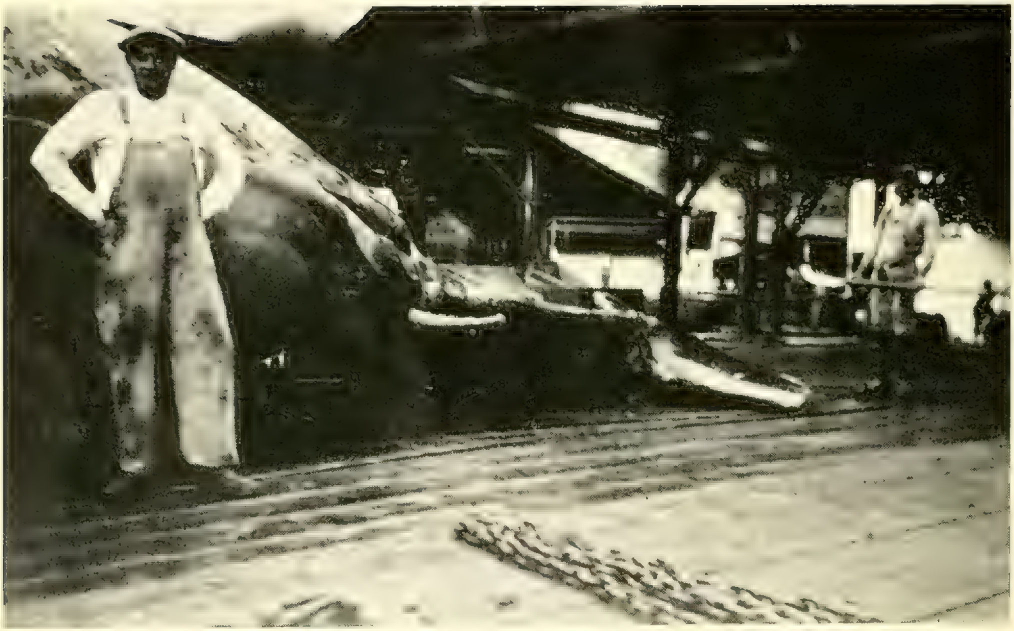

Fig. 1. Caudal part of the whale, showing the hind limb *in situ*

quite plentiful. From this information it is reasonable to think that upon further research a new subspecies may be recognized. Much more material, however, and in better condition is wanted and very desirable. Dr. Merriam states they have in the collection at Washington one similar specimen from Lake Bennet.

From time to time numerous reports have reached this Department of chipmunks having been seen in various localities on Vancouver Island, but upon close investigation we have been unable to substantiate any proof of their occurrence, and I very much doubt if chipmunks were ever native inhabitants of Vancouver Island, although some time about the year 1898 Mr. Albert H. Maynard, of Victoria, B.C., collected two chipmunks on the beach at Esquimalt. These skins, I understand from Mr. Maynard, were given to the late John Fannin, who was Director of this Museum at that time, but I cannot find any record of these skins in this Department; presumably they must have been sent to some authority for verification and not returned. Until such time as these skins can be located and their identity established, we cannot include them in the local fauna of Vancouver Island. It is possible that these two chipmunks which Mr. Maynard mentions may have been two animals that had been in captivity and liberated. (F. K.)

With further reference to the Notes on Mammals on page 10, Prov. Mus. Rep. 1920, "Notes on the Occurrence of a Humpbacked Whale having Hind Legs," a description of this was published by Mr. Roy Chapman Andrews in the American Museum Novitates No. 9, and is herewith copied, giving further descriptions and conclusions in regard to this remarkable case of external hind limbs in a humpbacked whale.

This is printed with the object that through our Annual Report it may become known to local residents who may be interested in this extraordinary find at Kyuquot Station.

It appears to have made quite a stir with a number of scientists, and the Director is in receipt of correspondence from Dr. Othenis Abel, Professor de Palaeontologie an der Wiener Universitat, who has published several pamphlets on whales and who wishes further information, if possible, concerning this remarkable find.

A REMARKABLE CASE OF EXTERNAL HIND LIMBS IN A HUMPBACK WHALE.

By Roy Chapman Andrews.

In July, 1919, a female humpback whale (*Megaptera nodosa*) with two remarkable protrusions on the ventral side of the body, posteriorly, was captured by a ship operating from the whaling-station at Kyuquot, on the west coast of Vancouver Island, British Columbia.

One of the protrusions was cut off by the crew of the vessel, but the other was photographed *in situ* by the superintendent of the station. Mr. Sidney Ruck and Mr. Lawson, officials of the Consolidated Whaling Company, appreciated the importance of the discovery and presented the skeletal remains of the attachment to the Provincial Museum, Victoria, B.C.

At my request, Mr. Francis Kermode, Director of the Provincial Museum, very courteously submitted the bones to me with permission to publish upon the result of my examination.

Under date of March 4th, 1920, Mr. Ruck writes to Mr. Kermode as follows:—

"I enclose herewith three photographs showing the unusual development of the pelvic rudiments in a whale captured at the Kyuquot Station last July, of which you have the bones. It is to be regretted that better pictures in evidence of this unprecedented development were not obtained.

"I have been connected with the whaling industry for twenty-two years and during my time have come in contact with prominent naturalists, such as Professor True, of the Smithsonian Institute; Professor Lucas, of the Natural History Museum, Brooklyn;* and Professor Andrews, of the Natural History Museum, New York, and neither in their experience or mine have the protrusion of the pelvic bones beyond the body ever been seen or heard of.

"This particular whale was a female humpback of the average length, with elementary legs protruding from the body about 4 feet 2 inches, covered with blubber about ½ inch thick.

"As shown in the best photograph, these legs protruded on either side of the genital opening; the left leg was cut off by the crew of the vessel and lost, and the point at which it was cut off is clearly shown in the photograph. The end of the leg seen in the picture terminated in a kind of round knob like a man's clenched fist.

"The two bones of the leg which you have are connected by cartilage, which I was informed had shrunk about 10 inches, and possibly more by this time. At any rate, the total length of the leg before it was cleaned of the blubber and flesh was, as before stated, about 4 feet 2 inches from the body."

---

* Then of the U.S. National Museum, now of the American Museum of Natural History.

After studying the material and discussing it with various scientists, I have come to the conclusion that the protrusions actually do represent vestigal hind limbs and show a remarkable reversion to the primitive quadripedal condition.

I am well aware that zoologists are inclined to accept reported instances of reversion with extreme reluctance, and that at first sight the tendency will be to consider this a teratological case of no reversionary significance, but the evidence is so strong that I cannot interpret it that way.

Mr. Ruck reports that the total length of the leg "before it was cleaned of the blubber and flesh" was about 4 feet 2 inches. The skeletal remains in my possession consist of two bones and two heavy cartilages. When placed in position as in Fig. 2, the total length is 31 inches.

Femur.—The larger bone is deeply concave proximally and to it is attached a massive cartilage (Fig. 3) which in its present shrunken condition is 5¼ inches in length and 1⅝ inches wide. I estimate that this cartilage was at least 15 inches long and 3 inches wide when fresh. I believe that this cartilage represents the femur. It probably lay entirely within the body, its proximal end being attached to the pelvic vestiges. Such a massive cartilage must necessarily have had a firm support and leads me to believe that the pelvic elements in this individual were of extraordinary size. The pelvic bones as usually present in the *Megaptera* are slender ossifications about 6 or 8 inches in length and would not furnish a firm enough base for the attachment of a cartilage which in its fresh condition was as large as a man's wrist.

Since the photograph of the limbs *in situ* shows that they were directly below the usual location of the pelvic vestiges, and since there are no other "floating" bones near this region, the conclusion that they were attached to the pelvic elements is entirely justifiable.

Tibia.—The larger of the two bones I identify as the tibia (Fig. 3). It is 14½ inches in greatest length, is well developed, and has a hard smooth outer surface. At the proximal end its greatest width is 3¾ inches, it narrows gradually for three-fourths of its length, and then suddenly expands at the distal extremity, where it is 2½ inches wide.

Tarsus.—The distal end of the tibia is convex and gives attachment to a cartilage which in its shrunken state is 4¾ inches long and 1¾ inches wide (Fig. 4). This cartilage, I believe, represents the tarsus. That it presents no ossifications is by no means surprising, as the carpal bones in the fore limbs of cetaceans are sometimes entirely absent and often in a more or less rudimentary condition. Mr. Ruck says: "The two bones of the leg which you have are connected by cartilage which I was informed had shrunk about 10 inches and possibly more by this time." This would give the tarsal cartilage a length of nearly 15 inches.

Metatarsal.—The distal element in the leg is a hard, well-developed bone which I identify as a metatarsal (Fig. 4). It has the characteristic shape of the metacarpals in the fore limbs of cetaceans, except that it is more slender. It is 6⅛ inches long, 1⅞ inches wide proximally, and 1⅞ inches in distal width; its least width is $^{13}/_{16}$ inch. To the distal end of the metatarsal is attached a heavy cartilage, of which only ¾ inch remains intact. This cartilage probably formed the extremity of the limb skeleton.

External Appearance of the Limb.—In reference to the limb as it appeared in the fresh condition, Mr. Ruck says that the end terminated in a "kind of round knob like a man's clenched fist," that the total length was about 4 feet 2 inches, and that it was covered with blubber about ½ inch thick. I infer from Mr. Ruck's description that the connective tissue and blubber were essentially the same as in the flipper, or fore limb, of cetaceans. The photograph of the limb *in situ* (Fig. 1) shows that there are two prominent, truncated tuberosities on the distal half. The proximal "bunch" evidently indicates the distal end of the tibia and the other is at the extremity of the metatarsal. These tuberosities may very properly be homologized with those on the outer, or anterior, edge of the flipper in the *Megaptera*, which indicate the extremities of the radius and the second digit. This is, I believe, a point which has considerable significance.

Since the stalk-like cartilaginous femur probably lay entirely within the body and the remainder of the limb entirely outside, there was undoubtedly a certain flexibility at the point of junction with the body.

In a paper entitled "Untersuchungen an walen,"* Professor W. Kükenthal has described external rudimentary hind limbs in three early embryos of *Megaptera*. These appear as two

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* Jenaische Zeitschrift für Naturwissenchaft, LI. 1914, pages 49–52.

PLATE II

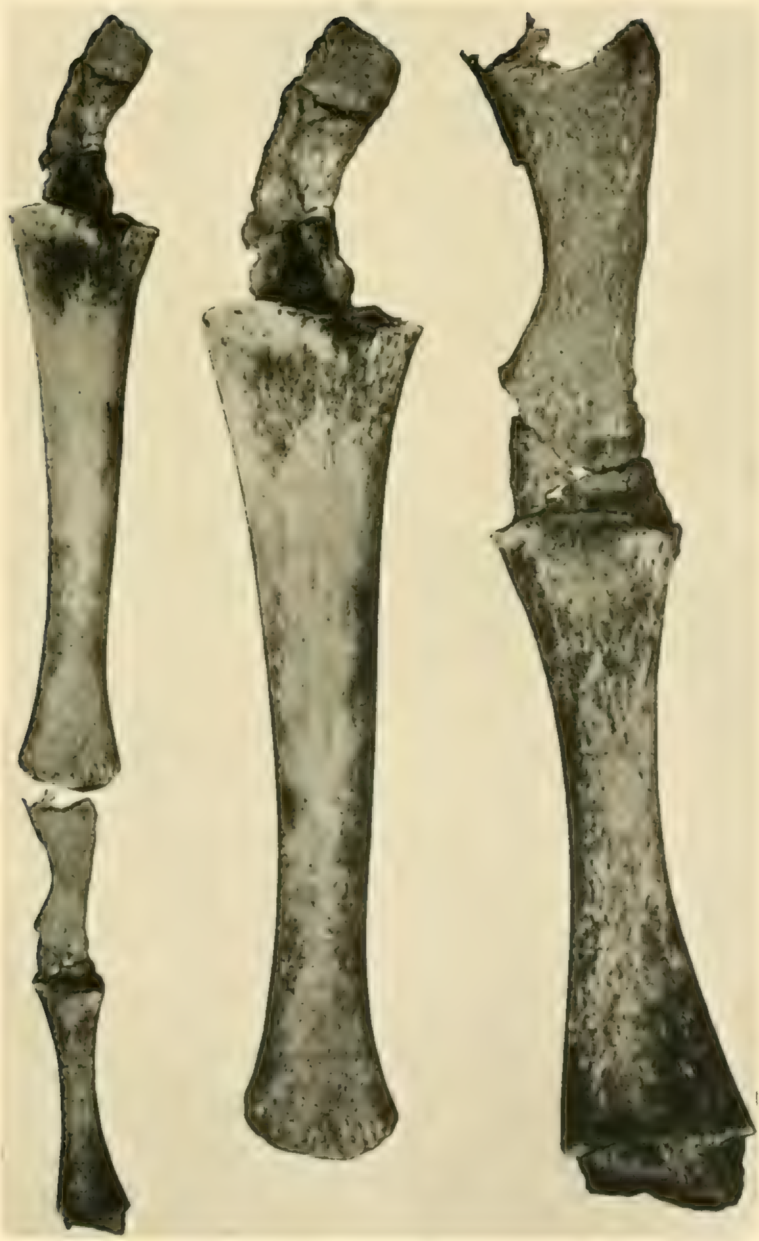


Fig. 2. Skeleton of the hind limb. Fig. 3. Cartilaginous femur and osseous tibia
Fig. 4. Cartilaginous tarsus and osseous metatarsal

more or less caudally directed papillæ on either side of the genital organ in the same relative position as the hind limbs which I have described in this paper. In Kükenthal's Stage I. (an embryo 32 mm. in length) the rudiments are best developed and are 1.2 mm. long. In Stage II. (an embryo 28 mm. long) the rudiments are somewhat less distinct, reaching a length of 0.8 mm. In Stage III. (an embryo 30 mm. long) the hind-limb rudiments have still more decreased in size and appear as minute papillæ.

Kükenthal has also discovered hind-limb rudiments in embryos of *Phocæna communis* and *P. dalli*, and Guldberg has recorded them in embryos of *Lagenorhynchus acutus* and *Phocæna communis*.

Kükenthal states that the hind-limb rudiments are found in later embryonic stages of the Mystacoceti than in the Odontoceti, and concludes that in the evolution of cetaceans the hind limbs lost their functional character in the Odontoceti earlier than in the Mystacoceti.

Since Kükenthal's and Guldberg's researches have shown that external hind-limb rudiments are still present in some cases in embryonic life, it is by no means impossible that these vestigial organs should continue their growth and persist until the adult stage. I believe that that is exactly what has occurred in the specimen which I have described above, and that we are confronted with a clear case of partial reversion to a primitive quadripedal condition.

The limbs, according to the statements of the whalers, were symmetrical; they are in the exact position in which the hind-limb rudiments have been found in embryonic *Megaptera;* there are strong indications that the cartilaginous femur was attached to the pelvic elements; they are homologous in many respects to the flippers, or fore limbs, and were this a teratological case it is doubtful if these homologies would exist.

Unwilling as are many evolutionists to accept reported cases of reversion, I can see no other explanation for the facts presented here. That this condition is extremely rare must certainly be true, for, so far as I am aware, this is the only recorded case among cetaceans. The presence of rudimentary hind limbs would almost certainly attract the attention of whalers under any condition and eventually be reported to a scientific institution, as was done in the case under consideration. Although hundreds of thousands of whales have been killed, especially in the last fifty years since the beginning of shore-whaling, no other instance has been reported. We are greatly indebted to Mr. Ruck and Mr. Lawson for their quick appreciation of the importance of their discovery, and I wish again to express my thanks to Mr. Kermode for giving me the privilege of describing it.

ORNITHOLOGY.

While no field-work has been done by the Department in the branch of ornithology, several persons who are very much interested in bird-life of this Province have made presentations of specimens to the Museum. One of the most rare specimens taken was presented by Mr. J. G. French, of Sooke, a white-winged dove (*Melopelia asiatica*), A.O.U. No. 319. This is the farthest northern record of this dove. The range of this bird in Lower California, Southern Arizona, Texas, Florida, south to Cuba, Jamaica, and Costa Rica. Accidental in Washington, one specimen being taken by Mr. J. H. Bowles, of Tacoma, November 7th, 1907. Concerning the specimen collected by Mr. J. G. French at Sherringham Point, Renfrew District, Vancouver Island, in July, 1918, he informs me that there were two of the birds together on that occasion, and without doubt this is now the most northerly record for this accidental visitor.

Other birds and specimens collected by several persons and presented to the Museum are herewith listed below.

ACCESSIONS.

Black Merlin (*Falco columbarius suckleyi*). Presented by Mr. W. Long, Mount Douglas, Victoria, B.C., January 18th, 1921.

Killdeer Plover (*Ægialitis vocifera*). Two specimens presented by Mr. Arthur Trill, Errington, B.C., April 19th, 1921.

North-western Red-wing (*Agelaius phœniceus caurinus*). Presented by Mr. Arthur Trill, Errington, B.C., April 19th, 1921.

North-western Red-wing (*Agelaius phœniceus caurinus*). Presented by Mr. H. Rawlings, Parksville, B.C., April 19th, 1921.

Killdeer Plover (*Ægialitis vocifera*). Presented by Mr. H. Rawlings, Parksville, B.C., April 19th, 1921.

Red-backed Rufous Hummingbird (*Selasphorus rufus*). Presented by Lizzie and John Dool, Ladysmith, B.C., April 22nd, 1921.

Bonaparte's Gull (*Larus philadelphia*). Two specimens presented by Miss Doreen Dodd, Telegraph Creek, B.C., June 8th, 1921.

Black-headed Grosbeak (*Zamelodia melanocephala*). Presented by Mr. H. Rawlings, Parksville, B.C., June 18th, 1921.

Black-headed Grosbeak (*Zamelodia melanocephala*). Presented by Mr. Arthur Trill, Errington, B.C., June 20th, 1921.

Cooper's Hawk (*Accipiter cooperii*). Two specimens presented by Mr. R. Gidley, Victoria, B.C., July 8th, 1921.

Western Robin (albino) (*Merula migratoria propinqua*). Presented by Mr. G. H. Cavin, Cedar, B.C., November 11th, 1921.

Snowy Owl (*Nyctea nyctea*) killed at Victoria, B.C. Two specimens presented by Provincial Police Department.

White-winged Crossbill (*Loxia leucoptera*). Presented by Mr. Dennis Ashby, Duncan, B.C., January 6th, 1922.

Lumpfish (*Eumicrotremus orbis*). Presented by Mr. Theodore Sebring, Victoria, B.C., April 1st, 1921.

Broad-finned Cod (*Zaniolepis latipinnis*) caught near Crofton, B.C. Presented by Mr. H. F. Prevost, Duncan, B.C., June 20th, 1921.

Crab (*Phyllolithodes papillosus*). Presented by Mr. A. McMurtrie, Ladysmith, B.C., September, 1921.

Chiton (*Cryptochiton Stelleri*). Presented by Mr. John Ead, Fanny Bay, B.C., October 3rd, 1921.

Blue-tailed Lizard (*Eumeces skiltonianus*) found at North Shore, Kootenay Lake, September, 1921. Presented by Master J. G. H. Dicken Spurway.

Blue-tailed Lizard (*Eumeces skiltonianus*) found at Edgewood, B.C. Presented by Mr. C. P. Coates, October, 1921.

Indian arrow-points presented by Mr. O. H. Brown, Victoria, B.C.

Indian spear-point and chisel presented by Mr. Joseph Tracey, Gordon Head, B.C.

Fossil shell presented by Mr. Nelson Smith, Nanaimo, B.C., August 1st, 1921.

Fossil shells and leaf presented by Mr. Pete Pasqual, Nanaimo, B.C., February 28th, 1921.

Black Bear skull found at Namu, B.C. Presented by Mr. W. A. Newcombe, September, 1921.

Marten-skin presented by Mr. J. W. Cockle, Kaslo, B.C., April 7th, 1921.

Black Squirrel skin presented by Mr. Carl Wihksne, South Fork, Bridge River, Lilloet, B.C., June 10th, 1921. This mammal is a melanistic form of the Red Squirrel (*Sciurus hudsonicus*).

Black-tailed Deer (albino) (*Odocoileus columbianus columbianus*) killed at Chilliwack by E. S. Thornton, November 16th, 1921.

Collection of *Sciurus*, *Evotomys*, and *Peromyscus*, collected at Bella Coola and presented by Mr. Harlan Smith, July 30th, 1921.

Entomological collection presented by Mr. Bryant, Ladysmith, B.C.

Collections of plants presented by several persons, of which further mention is made in the Botanical section.

PUBLICATIONS OF OTHER INSTITUTIONS.

(Alphabetically arranged.)

Art Institute of Chicago, Illinois	1
Art, Historical and Scientific Journal, Vancouver, B.C.	1
Archæological Society of Ontario, Toronto, Ont.	1
Bernice Pauahi Bishop Museum, Honolulu, Hawaii	12
Boston Society of Natural History, Boston, Mass.	1
Bristol Museum and Art Gallery, Bristol, England	1
Brooklyn Institute of Arts and Sciences, Brooklyn, N.Y.	1
California Academy of Sciences, San Francisco, Cal.	13
California University, Berkeley, Cal	6
Carried forward	37

Publications of other Institutions—*Continued.*

Brought forward	37
Cardiff Museum, Cardiff, Wales	1
Carnegie Museum, Pittsburgh, Pa.	2
Charleston Museum, Charleston, S.C.	2
Children's Museum of Boston, Bosten, Mass.	1
City Art Museum, St. Louis, Mo.	5
Colorado Museum of Natural History, Denver, Col.	1
Cornell University, Ithaca, N.Y.	6
Dominion Government Publications, Ottawa	51
Detroit Institute of Arts, Detroit, Mich.	7
Field Museum, Chicago, Ill.	1
Gray Herbarium, Harvard University	5
Illinois State Natural History Survey, Urbana, Ill.	5
Instituto General y Tecnico de Valencia, Valencia, Spain	1
John Crerar Library, Chicago, Ill.	1
Library of Congress, Washington, D.C.	2
Manchester Museum, Manchester, England	1
Minneapolis Institute of Arts, Minn.	8
Minnesota University, Minn.	4
Museum American Indian Heye Foundation	1
Museum of Fine Arts, Boston, Mass.	4
National Museum, Philadelphia, Pa.	1
Newark Museum Association, Newark, N.J.	3
Nebraska University, Lincoln, Neb.	2
New York Botanical Garden, N.Y.	2
Ohio Agricultural Experimental Station, Wooster, Ohio	6
Oklahoma University, Norman, Okla.	1
Peabody Museum, Salem, Mass.	1
Peabody Museum, Yale University, New Haven, Conn.	22
Pennsylvania Museum and University	7
Philadelphia Academy of Natural Sciences, Pa.	2
Roger Williams Park Museum, Providence, R.I.	7
Royal Scottish Museum, Edinburgh, Scotland	1
Smithsonian Institution, Washington, D.C.	32
Staten Island Institute, New Brighton, N.Y.	3
Sydney Museum, Australia	9
United States Department of Agriculture, Washington, D.C.	6
University of Washington, Seattle, Wash.	4
Wagner Free Institute of Science, Philadelphia, Pa.	2
Zoological Society, New York, N.Y.	2
Zoological Society, Philadelphia, Pa.	1
	260

BOTANY.

By W. R. Carter.

Considerable activity has been prevalent among collectors in several portions of the Province, and from these sources much desirable material has been added to the collection in the Herbarium of the Provincial Museum.

Our gratitude must be extended to the following gentlemen for their kindness in contributing a large amount of material which not only has added to the collection, but has increased our knowledge of the distribution of a number of plants, or, in other words, their known range has been extended: Dr. C. F. Newcombe; Mr. W. B. Anderson; Mr. W. A. Newcombe; Professor J. K. Henry; Mr. T. P. Mackenzie and Mr. G. V. Copley, of the Grazing Commission; Mr. J. R. Anderson; Mr. A. R. Sherwood; Mr. Dennis Ashby; and Dr. M. O. Malte.

Mr. E. B. Webster, of Port Angeles, Washington, very kindly donated specimens of *Senecio Websteri* n. sp., a rare plant which he collected on the talus-slopes of Mount Angeles, Clallam

County, Washington. These specimens are very desirable, as there is a possibility that this and some of the other plants at present only known to the Olympic Range may eventually be found on some of the higher mountains on the west coast of Vancouver Island.

Mr. George Fraser, of Ucluelet, Vancouver Island, presented a number of specimens of hybridization, chiefly among *Rubus*, upon which he has been working since 1912, in order to find out if he could throw any light on the parentage of the loganberry. He is to be congratulated for his marked strides of success in producing many interesting variations between well-known cultivated varieties and our native species, which should prove of much scientific value to horticulturists; the following list represents the results of his research:—

English raspberry x *Rubus nutkanus.*
Rubus nutkanus x English raspberry.
English raspberry x *Rubus spectabilis*
English raspberry x *Rubus leucodermis.*
Rubus macropetalus x English raspberry.
Rubus macropetalus x Mongrel raspberry. the result of crossing *Rubus spectabilis* with raspberry.
Rubus macropetalus x Erie blackberry (*Rubus canadensis*).
Rubus macropetalus x Lucretia dewberry (*Rubus villirus* var.).
Rubus macropetalus x Loganberry.
Upright seedling from *Rubus macropetalus* x Loganberry.
Loganberry x English raspberry (infertile).
Loganberry x *Rubus nutkanus* (fertile).
Loganberry x *Rubus nutkanus* (infertile).
Loganberry x *Rubus spectabilis* (fertile).
Loganberry x *Rubus laciniatus* (infertile).

In the above list Mr. Fraser states the first named is the seed parent.

Another consignment of hybridization received from Mr. Fraser included the following plants:—

Rubus parviflorus x *R odoratus.*
Fruit and foliage of *Rubus ursinus* x Loganberry.
Fruit of *Pyrus diversifolia* x cultivated variety of P. *malus.*
Myosotis laxa x *Myosotis palustris semperflorens.*
Lonicera Perclymenum x *Lonicera ciliosa* (fertile).
Knight's hybrid *ribes.*
Campanula rotundifolia var.
Aster?

Mr. Fraser states the following plants, of which he also very kindly donated specimens, with the exception of *Vaccinium macrocarpum* Ait., have established themselves by seeding unassisted on ground which has been cleared and burned but never has been cultivated:—

Rhododendron ponticum.
Calluna vulgaris.
Calluna vulgaris alporti.
Calluna vulgaris alba.
Daböccia polifolia.
Daböccia polifolia alba.
Erica vagans.
Erica vagans var. *alba.*
Spiræa Bumalda.
Pernethya mucronata.
Vaccinium macrocarpum.

It will be interesting to note whether any of these plants later become distributed and established throughout the Ucluelet District.

There has been an increase in the number of visitors seeking information about our native flora, and a large increase over previous years in the quantity of plants sent in for identification, Mr. T. P. Mackenzie and Mr. G. V. Copley, of the Grazing Commission, sending in approximately 300 specimens, many of them plants from the dry interior of the Province, and wherever possible duplicate specimens have been donated for the Herbarium collection.

Among these plants, the following are of special interest:—

Agropyron dasystachyum (Hook.) Scribn.
Bromus Porteri (Coult.) Nash.
Danthonia intermedia Vasey.
Elymus dasystachys Trin.
Panicum capillare L.
Poa brachyglossa Piper.
Poa nervosa (Hook.) Vasey.
Poa Sandbergii Vasey.

Sporobolus asperifolius Thurber.
Stipa comata Trin. & Rupr.
Carex? atrata L. var. *ovata* Boot.
Carex sychnocephala Carey.
Juncus Mertensianus Bong.
Luzula spicata (L.) DC.
Eriogonum niveum Dougl.
Polygonum acre leptostachyum Meisn.
Polygonum Douglasii Greene var. *montanum* Small.
Atriplex argentea Nutt.
Chenopodium leptophyllum Nutt.
Monolepis Nuttalliana (Schultes) Engelm.
Salicornia europoea L.
Suæda depressa (Pursh.) Wats.
Amaranthus paniculatus L.
Silene Douglasii Hook. var. *multicaulis* Rob.
Sisymbrium canescens Nutt.
Asclepias speciosa Torr.
Mertensia paniculata Don.
Salvia pratensis L.
Chænactis Douglasii H. & A.
Iva xanthiifolia Nutt.

Mr. W. B. Anderson, as is his usual custom, brought in a number of plants collected over a large portion of the Province, including Prince Rupert, Anahim, and Fort George in the north, the Columbia River Valley in the east, Southern Okanagan to the south, Chilliwack and Lytton to the west, besides a small series from Vancouver Island.

Specimens mounted and placed in the collection include:—

Sisyrinchium Macounii Bickn.
Urtica urens L.
Silene Douglasii Hook. var. *Macounii* Rob.
Arabis? Macounii S. Wats.
Sisymbrium linifolium Nutt.
Thelypodium laciniatum Endl.
Saxifraga nivalis L.
Astragalus Purshii Dougl.
Geranium Robertianum L.
Mimulus peduncularis Dougl.
Pentstemon Richardsonii Dougl.
Cynoglossum? grande Dougl.
Antennaria? aprica Greene.
Anthemis tinctoria L.
Crepis occidentalis Nutt.
Gnaphalium Macounii Greene.
Helianthus Nuttallii T. & G.

Besides these, there are a number of Compositæ as yet undetermined.

The following additions to the Herbarium are also recorded:—

Aristida purpurea Nutt; *Hemicarpha aristulata* (Coville) Smyth. Presented by Dr. M. O. Malte.

Orthocarpus purpurascens Benth. Presented by Dr. C. F. Newcombe.

Phyllospadix Scouleri Hook.; *Cakile edulenta* Hook. Presented by Mr. W. A. Newcombe. Collected on the west coast of Calvert Island, extending their previously known range.

Portulaca oleracea L. Presented by Mr. A. R. Sherwood. This plant appears to be spreading in the vicinity of Victoria and may become a troublesome weed.

An *Epipactes* as yet unidentified, presented by Mr. W. Burton.

Iris (introduced), not yet identified; *Lupinus micranthus* Dougl., a pink flowering form; *Plantago lanceolata* L., an uncommon form. Presented by Professor J. K. Henry.

Poa bulbosa L.; *Euphorbia glyptosperma* Engelm.; *Zizia cordifolia* (Walt.) DC. Presented by Mr. W. R. Carter.

Allium sp. *Moly* L. This *Allium* with its handsome yellow flowers and strong scent has escaped from cultivation and is now spreading and growing in a wild state in portions of the Cowichan District. Presented by Mr. Dennis Ashby.

The following are additions to our Canadian and Provincial flora:—

Caphalanthera oregana Reich. A single specimen collected and retained by Mr. R. Glendenning at Agassiz, July, 1918, and identified by Professor C. V. Piper, of Washington, D.C. New to Canada.

Hemicarpha aristulata (Coville) Smith. Collected at Cadboro Bay, V.I., July 7th, 1921, by Dr. M. O. Malte. New to Canada.

Silene Douglasii Hook. var. *Macounii* Rob. Collected at Comox, V.I., by Mr. W. B. Anderson. New to Vancouver Island.

Poa bulbosa L. Collected Beacon Hill Park, Victoria, B.C., May 17th, 1921, and identified by Mrs. Agnes Chase, Washington, D.C.

Euphorbia glyptosperma Engelm. Fitzgerald, V.I., August 7th, 1921; *Zizia cordifolia* (Walt.) DC., Fitzgerald, V.I., July 31st, 1921. Collected by Mr. W. R. Carter. New to Vancouver Island.

Other plants identified included a mounted series of over 100 species from South Park School. These specimens, while not of full herbarium size, were exceedingly well prepared and reflect great credit on those pupils and teachers responsible for the work. A large series of unmounted plants were identified for Happy Valley, Kingston Street, and other schools.

Again this past season Miss M. Lawson, of the *Colonist* staff, undertook, for the benefit of the children, the task of editing a Flower Calendar in the Sunday edition of the *Daily Colonist* of plants collected by children from various schools and districts. A large number of plants were identified weekly, and a marked improvement in the condition of specimens sent in was noticeable over last year, especially among a few of those who were consistent in sending a series in every week.

Mrs. Agnes Chase, Acting Systematic Agrostologist of the Bureau of Plant Industry, United States Department of Agriculture, Washington, D.C., very kindly examined and determined our collection of grasses, which is now revised under present nomenclature. This revision has added several species to the list of Vancouver Island flora.

In the latter part of the summer a "Preliminary Catalogue of the Flora of Vancouver and Queen Charlotte Islands" was received from the hands of the printers, and copies have been distributed to most of the scientific institutes and colleges in America and other countries, and up to the present time we have received numerous applications for copies from teachers and others interested in botany, residing in many portions of this Province.

"The following list of plants are supplementary additions to "The Flora of Vancouver and Queen Charlotte Islands, 1921" (introduced plants being printed in italics in conformity with the printing of the Check-list) :—

Lycopodium annotinum L. Mountains, V.I.

Potamogeton amplifolius Tuckerm. Henry's "Flora of Southern British Columbia."

Agrostis hyemalis var. geminata (Trin.) Hitchc. Mount Arrowsmith, V.I.

Agrostis idahoënsis Nash. Victoria, Macoun.

Agrostis palustris Hitchc. Sidney, V.I., Macoun.

Danthonia Macounii Hitchc. Macoun, No. 78823. Mount Benson, V.I.

Elymus arenarius compositus (Abromsit) St. John. Beacon Hill Park, Victoria, J. R. Anderson.

Glyceria scabra Malte sp nov. Macoun's List, 1918.

Pucinellia nutkænsis (Presl.) Fern & Weath. Sidney, V.I., Macoun.

Pucinellia nuttalliana (Schult.) Hitchc. Nanaimo, V.I., Macoun.

Poa bulbosa L. Beacon Hill Park, Victoria, W. R. Carter.

Stipa minor (Vasey) Scribn. Macoun's List, 1918.

Carex sterilis cephalentha Bailey. Port Renfrew, Rosendahl.

Juncus columbianus Covilie. Macoun's List, 1918.

Hemicarpha aristulata (Coville) Smyth. Cadboro Bay, V.I., Malte.

Polygonum erectum L. Macoun's List, 1918.

Chenopodium leptophyllum Nutt. Macoun's List, 1918.

Sagina saginoides (L.) Brit. Nanaimo, Hardy Bay,. V.I.

Silene Douglasii var. Macounii Rob. Comox, V.I., W. B. Anderson.

Lepidium oxycarpum T. & G. Cadboro Bay, V.I., Macoun.

Lathyrus nevadensis S. Wats. Cowichan Lake, V.I., J. R. Anderson.

Euphorbia glyptosperma Engelm. Fitzgerald, V.I., W. R. Carter.

Callitriche palustris L. Port Renfrew, V.I., Rosendahl.

Zizia cordata (Walt.) DC. Fitzgerald, V.I., W. R. Carter.

Plagiobothrys tenellus Gray. Generally distributed, southern end of Vancouver Island.

Castilleja acuminata (Pursh.) Spreng. Port Renfrew, V.I., Rosendahl.

Orthocarpus purpurascens Benth. Mount Finlayson, V.I., Dr. C. F. Newcombe.

Galium cymosum Wiegand. Henderson Lake, V.I., W. A. Newcombe. Cowichan Lake, Thetis Lake.

Centaurea ro-chinensis Bernh. Victoria, V.I., J. R. Anderson.

Cotula australis Hook. Nanaimo, V.I., Macoun.

Solidago caurina Piper. Prospect Lake, V.I., J. R. Anderson.

Solidago lanceolata L. Ucluelet, V.I., Macoun.

ENTOMOLOGY.

By E. H. Blackmore, F.E.S.

Collecting during the past season has not been at all good, although, taken on the whole, it has been somewhat better than the three preceding years.

We had an exceedingly wet winter, which continued, with the exception of a few short dry spells, until late in the spring. Reports from various parts of the Province all speak of poor collecting weather. However, a number of rare and uncommon species were obtained by various collectors, which will be noted under their respective localities.

Early in the year Mr. Theodore Bryant, of Ladysmith, offered to donate to the Provincial Museum a large number of his duplicate Lepidoptera. Arrangements were made whereby the writer was enabled to visit Mr. Bryant in the latter part of May and thereby enabled to select the most desirable of the material offered. In addition, Mr. Bryant kindly loaned the writer his entire collection of Microlepidoptera to work over during the winter months. We are especially glad to have the use of this collection, as it contains most of the identical specimens recorded from Wellington in the 1906 Check-list of British Columbia Lepidoptera; as was mentioned in last year's Museum report, page 23, the large majority of species listed in this group were either from Mr. Cockle, of Kaslo (168), or Mr. Bryant, of Wellington (94). I hope to start work on this collection early in the New Year, as the greater number are simply pinned and need relaxing and mounting. Many of the species are erroneously named and many need verification.

Mr. A. W. Hanham, of Duncan, B.C., has also generously placed at my disposal a large number of unidentified specimens in this group.

The European satin-moth (*Stilpnotis salicis* Linn.) has spread rather rapidly and has been reported from several localities other than New Westminster, where it was first noticed. It was found in Vancouver occupying an area several blocks square. Mr. L. E. Marmont, of Maillardville, reported a heavy infestation in his district, and it has also been found at Cowichan Bay, on Vancouver Island. I have recently identified specimens of this species for Mr. J. F. Clarke, who took them at Bellingham, Wash. It is to be regretted that it is spreading so rapidly, as it is likely to become a serious pest to our native poplars.

British Columbia Insects new to Science.

Owing to the strike in the printing trade in Eastern Canada early in the spring a number of entomological magazines were held up, with the result that even now many of them are from two to three months behind in their issues. Consequently, we can only list those species the descriptions of which have appeared up to the time of writing this article (December 31st). Any species that may be described in the belated issues will be included in next year's Provincial Museum Report. Up to date there have been forty-five insects from British Columbia described as new to science during the present year. They include eight species of Lepidoptera, one species of Hymenoptera (parasitic), thirty-two species of Diptera, and four species of Hemiptera.

Lepidoptera.

Of the eight species of Lepidoptera, one belongs to the Lycaenidæ, one to the Noctuidæ, one to the Lymantriidæ, four to the Pyralidæ, and one to the Pterophoridæ. They are as follows:—

Lycaenidæ (Theclinæ).

Strymon melinus race *atrofasciata* McDunnough. Described in the Can. Ent., Vol. 53, page 47, Feb., 1921, from specimens taken at Wellington, B.C. (Taylor); Duncan, B.C. (Livingstone); Royal Oak, B.C. (Treherne); and Victoria, B.C. (Cameron). The above race differs from typical *melinus* in its deep steely-grey ground colour and the heavy black spotting on the underside. The lack of orange margin to spots alluded to in the description is not a constant character, as out of a long series in my own collection there are several which have the orange margins strongly pronounced. Dr. McDunnough was of the opinion that this race was confined to Vancouver Island, but I have specimens from many points on the Mainland which are typical of this new race, and it can safely be assumed that *atrofasciata* occurs throughout the whole of Southern British Columbia. It is double-brooded, occurring in May and again in July.

Noctuidæ.

Anomogyna partita McDunnough. Described in the Can. Ent., Vol. 53, page 179, Aug., 1921, from five specimens. The type taken at Banff, Alta. (Wallis); two paratypes from Kaslo, B.C. (Cockle); and two paratypes from Nordegg, Alta. (McDunnough).

Lymantriidæ.

Hemerocampa pseudotsugata McDunnough. Described in the Can. Ent., Vol. 53, page 53, March, 1921. This is the tussock-moth which I had previously determined (*vide* Rep. Prov. Mus., 1918, page 12) as *Hemerocampa vetusta gulosa* Hy. Edw. It was originally discovered by Mr. W. B. Anderson at Chase, B.C., who found it doing considerable damage to Douglas fir. Upon the receipt of a number of egg-masses from Mr. Anderson in the spring of 1920, Dr. McDunnough was enabled to breed it from the egg to the adult. From his observations on the larval stages he came to the conclusion that the species was distinct and undescribed.

Pyralidæ (Scopariinæ).

Scoparia basalis race *pacificalis* Dyar. Described in Ins. Ins. Mens., Vol. IX., page 66, April–June, 1921, from four specimens taken at Victoria, B.C. (Blackmore); Mount Newton, near Saanichton, B.C. (Blackmore); and Grayland, Wash.

Scoparia commortalis Dyar. Described in Ins. Ins. Mens., Vol. IX., page 67, April–June, 1921, from three specimens taken by the writer at Victoria, B.C. This species is close to *rectilinea* Zeller, but is much browner and the paler areas more contrasting.

Pyralidæ (Crambinæ).

Crambus tutillus McDunnough. Described in Can. Ent., Vol. 53, page 160, July, 1921, from six specimens taken at Victoria, B.C. The type and four paratypes were taken by W. Downes; the other paratype was taken by the writer, mention of which was accidentally omitted from the original description. A note on this species will be found under the heading of "Illustrated Lepidoptera," together with a figure of the paratype on Plate IV.

Pyralidæ (Phycitinæ).

Pyla blackmorella Dyar. Described Ins. Ins. Mens., page 68, April–June, 1921, from two specimens taken by the writer on Mount Tzouhalem, near Duncan, B.C., on June 24th, 1913. A figure of the paratype will be found on Plate IV. and further remarks on the species under the heading of "Illustrated Lepidoptera."

Pterophoridæ.

Platyptilia albertæ B. & L. Described by Barnes and Lindsey in Cont. Lep. No. Amer., Vol. IV., No. 4, page 346, from four specimens. Holotype female, Laggan, Alta.; allotype male, Mount Cheam, B.C. (R. V. Harvey); and two paratype females, Laggan, Alta., and Olympic Mountains, Wash.

HYMENOPTERA (PARASITIC).

Ichneumonidæ.

Mycrsia grandis Cushman. Described in Proc. Ent. Soc. Wash., Vol. 23, page 110, May, 1921, from one female taken June 5th by Dr. H. G. Dyar at Kaslo, B.C. This specimen was found by Mr. Cushman among some undetermined Ichneumonidæ in the U.S. National Museum, and was probably taken by Dr. Dyar when he made his large collection of Lepidoptera at Kaslo, B.C., in 1903.

DIPTERA.

Mycetophilidæ (Fungus-gnats).

In the Proc. Brit. Col. Ent. Socy., Feb., 1920 (issued Nov., 1921), page 16 *et seq.*, Mr. R S. Sherman described the following sixteen species of this family:—

Mycoma mutabilis. Savary Island, April.
Platyura intermedia. Savary Island, July.
Dziedzickia vernalis. Vancouver, May.
Dziedzickia rutila. Vancouver, November.

Dziedzickia johannseni. Savary Island, April.
Dziedzickia columbiana. Vancouver, May.
Dziedzickia occidentalis. Savary Island, April.
Rhymosia prolixa. Savary Island, July.
Rhymosia faceta. Vancouver, February.
Rhymosia seminigra. Vancouver; Savary Island, March and October.
Rhymosia pectinata. Savary Island, April.
Rhymosia brevicornis. Vancouver, April.
Tetragoneura atra. Vancouver, May and June.
Tetragoneura marceda. Savary Island; Vancouver, April and May.
Tetragoneura fallax. Savary Island; Vancouver, April, May, and December.
Tetragoneura arcuata. Vancouver, May and June.

Mr. Sherman has made a special study of this family for a number of years and has greatly added to our knowledge of the species occurring within the Province.

These small flies or fungus-gnats, as they are called, resemble mosquitoes or midges to a great degree, but can at once be distinguished by the antennæ not being furnished with whorls of hair.

The abdomen of the male ends in a forceps-like process and in the female in a pointed ovipositor. The larvæ feed in fungi and in decaying vegetation and are not injurious, except when they attack cultivated mushrooms.

Tabanidæ (Horse-flies).

In a recent "Revision of the Canadian species of the *affinis* group of the genus *Tabanus*" by Dr. J. McDunnough, Can. Ent., Vol. 53, page 13 *et seq.*, he has recorded four new species, three of which are described from material wholly or partly collected in British Columbia.

Tabanus trepidus McD. This species occurs throughout the Dominion, the type lot containing specimens taken in Ontario; New Brunswick; Nova Scotia; Quebec; Manitoba; and Peachland, B.C.

Tabanus nudus McD. This species also has the same general range, specimens having been taken in Ontario; New Brunswick; Manitoba; Saskatchewan; and Mount Lehman (Lower Fraser Valley), B.C.

Tabanus atrobasis McD. The type material of this species is entirely confined to British Columbia, although Dr. McDunnough states that it extends south into Oregon. The holotype is from Mount Lehman, B.C. (S. Hadwen), and the paratypes are from Victoria, Royal Oak, Duncan, and Courtenay.

Bombyliidæ (Bee-flies).

Calopelta fallax Greene. Described in Proc. Ent. Soc. Wash., Vol. 23, page 23, Jan., 1921, from five specimens. Holotype, allotype, and one female paratype from Colorado, and one male and one female paratype from Royal Oak, B.C., taken on May 19th, 1917, by R. C. Treherne. *Calopelta* is also a new genus erected by Mr. Greene for the reception of this new species; it differs from the genus *Ploas*, which it most nearly resembles, by having only two submarginal cells in the wing instead of three, a feature which was pointed out by Dr. McDunnough.

Syrphidæ (Flower-flies).

Sphærophoria cranbrookensis Curran. Described in Can. Ent., Vol. 53, page 173, Aug., 1921, from a single male specimen taken by Mr. C. Garrett at Cranbrook, B.C., on May 25th, 1919

Helomyzidæ.

In an article entitled "Notes on Helomyzidæ and Descriptions of New Species," which appeared in Ins. Ins. Mens., Vol. IX., page 119 *et seq.*, July–Sept., 1921, Mr. C. B. D. Garrett describes eleven new species of this family, ten of which are from British Columbia. They are as follows:—

Leria aldrichi. Cranbrook, March.
Barbastoma barbatus. Sheep Creek, October.
Postleria fuscolinea. Cranbrook; Michel, May–June–August.
Amœbaleria scutellata. Cranbrook, May.
Amœbaleria gigas. Cranbrook; Michel, March to August.

Morpholeria melaneura. Cranbrook, April–May–October.
Pseudoleria pectinerata. Cranbrook, June.
Œcothea canadensis. Cranbrook; Michel, April–July.
Acantholeria œdiemus. Cranbrook; Michel, April–August.
Acantholeria abnormalis. Michel, July.

A new scheme of classification for this family has been proposed by Mr. Garrett, based chiefly on the length of the foremost fronto-orbital bristle, and six new genera have been erected, viz.: *Barbastoma, Postleria, Amœbalaria, Morpholeria, Pseudoleria*, and *Acantholeria.*

The species of this family are small dark-coloured flies looking something like dung-flies. They are found in damp shady places and fly in the twilight. The larvæ feed in fungi, decaying wood, and the dung of small animals, such as dogs, rabbits, and bats.

HEMIPTERA.

The following four species were described by Dr. H. M. Parshley in the Proc. Brit. Col. Ent. Soc., Feb., 1921, page 16 *et seq.*:—

Tingidæ.

Acalypta modesta. From three specimens taken at Royal Oak, B.C., by R. C. Treherne on May 14th, 1917.

Miridæ.

Daceria formicina. This species was described from several specimens taken by Mr. W. Downes in the Saanich District, B.C., and at Shawnigan Lake, B.C., in July and August, 1918.

Saldidæ.

Saldula comata. Holotype male and allotype female taken at Beaver Lake, Saanich District, B.C., by W. Downes, June 17th, 1919, and paratype female at Vernon, B.C. (Downes), September 26th, 1918.

Saldula nigrita. Described from specimens taken by Mr. Downes at Duncan, B.C., on September 17th, 1919.

LEPIDOPTERA NOT PREVIOUSLY RECORDED FROM BRITISH COLUMBIA.

The following annotated list contains those species of Lepidoptera which have been taken during the past two seasons and of which we have had no previous record. It does not include the Microlepidoptera, which are treated of under a separate heading, neither does it include the names of species recently determined as new to the Province, but which have stood as uniques in the cabinets of various collectors for a number of years. The numbers preceding the names are the same as those contained in Barnes & McDunnough's Check-list of North American Lepidoptera, 1917.

Noctuidæ.

1226. *Orosagrotis incognita* Sm. Mount McLean, near Lillooet, B.C., August 21st, 1920 (A. W. Hanham). Further remarks on this species will be found under the heading of "Illustrated Lepidoptera."

1256. *Euxoa floramina* Sm. A single specimen taken by A. W. Phair at Lillooet, B.C., on September 5th, has been determined by Dr. A. W. Lindsey as agreeing with specimens of *floramina* Sm. in the Barnes collection.

1274. *Euxoa rufula* Sm. Mount McLean, B.C., August 22nd, 1920. (*See* "Illustrated Lepidoptera.")

1288. *Euxoa exculta* Sm. A single specimen taken at Vavenby, B.C., by T. A. Moilliet on August 26th has been determined as this species by Dr. H. G. Dyar, who compared it with Smith's unique type. In Proc. U.S. N.M., Vol. XXII., page 424, Smith gives "North-west British Columbia" as the locality for the single male from which the species was described. It is more likely that "North-west Territory" was meant, as most of Smith's species described from this general locality have turned out to be from Northern Alberta. I believe that this Vavenby specimen is the first authentic record that we have of this species from British Columbia.

1364A. *Euxoa excellens* race *infelix* Sm. Fort Steele, B.C., August 15th, 1921 (W. B. Anderson). (*See* "Illustrated Lepidoptera.")

1388. *Rhizagrotis flavicollis* Sm. Vavenby, B.C., August 26th, 1921 (T. A. Moilliet). This species is listed in the 1906 B.C. Check-list from Wellington and Kaslo, but all the specimens that I have seen under this name (about fifty from a dozen different localities) have been *Euxoa ridingsiana* Grt. The two species are very much alike superficially, but *flavicollis* has a more yellow costa and the collar is yellow also. I have the species from Nordegg, Alta., and the Vavenby specimen agrees with these.

1584. *Lampra* (*Rhynchagrotis*) *nefascia* Sm. Goldstream, B.C., September 6th, 1920 (E. H. Blackmore). (*See* "Illustrated Lepidoptera.")

1642. *Anarta hampa* Sm. A single specimen taken on Mount McLean at 7,500 feet altitude by A. W. Hanham on August 21st, 1920.

2201a. *Sympistis zetterstedti* race *labradoris* Staud. Mount McLean, B.C., August 21st, 1921 (A. W. Hanham). (*See* "Illustrated Lepidoptera.")

2275a. *Trachea inordinata* race *montana* Sm. Chilcotin, B.C., May 30th, 1920 (E. R. Buckell). (*See* "Illustrated Lepidoptera.")

2364. *Tæniosea discivaria* Walk. Vavenby, B.C., July 18th, 1921 (T. A. Moilliet). (*See* "Illustrated Lepidoptera.")

2470. *Acronycta radcliffei* Harv. Quamichan Lake, near Duncan, B.C., June, 1921 (G. O. Day). (*See* "Illustrated Lepidoptera.")

2965. *Tarachidia semiflavana* Gue. Taken by J. W. Wynne at Enderby, B.C.

3222. *Syngrapha alticola* Wlk. A single specimen taken on Mount McLean, B.C., by A. W. Hanham on August 22nd, 1921. This was at one time believed to be a synonym of *devergens* Hubner, but is now regarded as a distinct species.

3509. *Zanclognatha jacchusalis* Wlk. Taken by T. A. Moilliet at Vavenby, B.C., on July 18th, 1921.

Geometridæ.

4009e. *Hydriomena nubilofasciata* race *vulnerata* Swett. Sluggett's, B.C., March 1st, 1921 (W. Downes). (*See* "Illustrated Lepidoptera.")

4129. *Nasusina leucata* Hulst. A single specimen taken by A. W. Phair at Lillooet, B.C., on July 16th, 1920.

4316-1. *Drepanulatrix secundaria* B. & McD. Kaslo, B.C., July, 1920 (J. W. Cockle). (*See* "Illustrated Lepidoptera.")

4453. *Dysmigia loricaria* Evers. Vavenby, B.C., July 18th, 1921 (T. A. Moilliet). (*See* "Illustrated Lepidoptera.")

4467. *Caripeta angustiorata* Wlk. Several specimens taken at Kaslo, B.C., by J. W. Cockle in 1920. This species is an inhabitant of the Atlantic States, but is recorded from Blairmore, Alta.

Rare and Uncommon Lepidoptera taken in British Columbia during 1921.

Victoria.—Mr. Martin Brinkman took the following noctuids during the present season, all of which are new records for Victoria: *Graptolitha torrida* Sm.; *Acronycta funeralis* G. & R.; and *Autographa speciosa* Ottol. They were all taken "at rest" on electric-light poles. He also took a specimen of that rather rare geometer *Gabriola dyari* Tayl.

Master Lewis Clark, who has recently become an enthusiastic collector, captured a fine specimen of *Autographa octoscripta* Grt. This is the first record of this species for Vancouver Island. It is a very rare species in British Columbia, as only three specimens have been recorded to my knowledge. He also bred from a pupa found in his father's garden a female specimen of that very rare geometer *Cleora excelsaria* Streck. It emerged on June 22nd. It is four years since I have had a record of this species, when I took a specimen at Goldstream on June 4th, 1917. A figure of this specimen was given in Rep. Prov. Mus., 1917, Plate II.

Mr. W. B. Anderson took specimens of *Polia restora* Sm. and *Septis alia* race *rorulenta* Sm. The former species is apparently increasing, as it has been taken by several local collectors during the past two or three years. It was at one time comparatively rare in collections.

Mr. W. R. Carter, who has collected assiduously during the season, has captured several very interesting species, amongst them being a nice series of *Ipimorpha nanaimo* Barnes. This species has been a comparative rarity for many years, but from certain conclusions reached last year an exhaustive search of certain localities resulted in an increased number of specimens being taken this season. As the specimens taken have always been in the vicinity of Lombardy poplar, I am inclined to the belief that this is its food-plant. There are two distinct colour forms of this species, the predominating form being of an even light-buff colour and the other is of a light olivaceous shade. Mr. Carter also took a couple of specimens of *Cerma cuerva* Barnes, both "at rest." This small noctuid seems to be of very retiring habits, as very few specimens have been captured. I have only taken two in eleven years' collecting in this vicinity. It was described from Victoria in 1907 (Can. Ent., Vol. 39, page 10), and with the exception of a couple of specimens taken by Mr. Cockle at Kaslo, I have not seen it from any other locality. A figure of this species was given in the Rep. Prov. Mus., 1919, Plate II.

Showing the extreme mildness of the Victoria winter climate, Mr. Carter took a freshly emerged specimen of *Coniodes plumogeraria* Hulst. on January 6th of this year. This is about two months earlier than it normally appears. A single specimen of *Erannis vancouverensis* Hulst. was taken on December 7th. A nice series of the wingless females of both *Paraptera danbyi* Hulst. and *Rachela occidentalis* Hulst. were taken by Mrs. Carter in the early part of December.

Goldstream.—The writer spent part of his vacation as well as a number of week-ends in this locality. The collection of "Micros" was the principal object in view, but several interesting species of other families were also taken. The most desirable of them being *Polia tacoma* Streck.; this is the first record from Goldstream, the other known localities being Duncan, Kaslo, and Rossland; *Graptolitha ferrealis* Grt., a perfect specimen "at rest"; *Euxoa obeliscoides* Gue.; *Trachea cinefacta* Grt.; *Alypia ridingsi* Grt.; this was the first specimen that I have any record of since I took a solitary individual in the same locality in July, 1912. They have a habit of settling on the railway-track in the hot sunshine of a July afternoon and slowly waving their wings up and down. They are extremely wary and very difficult to capture, as once they are disturbed their flight is exceedingly rapid. Later, Mr. Carter while collecting at Fitzgerald, some 12 miles north of Goldstream on a hillside about 700 feet elevation, saw a number of this species flying about a bed of *Valerianella congesta* (sea-blush). He managed to net some twelve specimens on three different dates. It is evident that it is a species that frequents higher altitudes and only occasionally comes down to the low levels, thus accounting for its apparent rarity. In the Geometridæ the writer took a single specimen of *Lobophora simsata* Swett.; a single *Spodolepsis substriataria* race *danbyi* Hulst.; this is the first record from this district. It apparently occurs sparingly throughout the whole of Southern British Columbia; a single specimen of *Entephria multivagata* Hulst. in beautiful condition; *Dysstroma cthela* Tayl., a perfect specimen (*see* "Illustrated Lepidoptera"); *Eupithecia mutata* Pears.; this rare species I have also figured on Plate IV.; and two fine male specimens of *Sabulodes cervinaria* Pack.; these were taken "at light" about 11 p.m. on June 2nd and are the first of this species that I have captured.

Fitzgerald.—Mr. Carter, who collected regularly every week-end in this locality, took many desirable species during the season, chief of which were a single *Gortyna pallescens* Sm. (new locality); *Annaphila decia* Grt.; this pretty little noctuid is rather uncommon in the southern part of the Island, though I believe it occurs a little more frequently at Duncan. Amongst the geometers, *Drepanulatrix rectifascia* Hulst. and *D. falcataria* Pack. were the best captures.

Alberni.—Mr. John Redford collected a large number of specimens during the past season, the most interesting of which are the following: *Euxoa costata* Grt. (uncommon); *Agrotis esurialis* Grt. (uncommon); *A. oblata* Morr.; *Euretagrotis perattenta Grt.;* this record extends the known range of this species considerably, my previous records being from Vernon and Chilliwack. It is rare in British Columbia collections. *Trachea indocilis* Walk.; *Papaipema insulidens* Bird, one specimen taken "at light." Previous to this specimen I have only seen the species from Duncan (Day). It is very uncommon, a few odd specimens being taken "at light" occasionally; if its food-plant was known it could doubtless be obtained in greater numbers. It was described from Vancouver Island. *Eosphoropteryx thyathroides* Gue.; two specimens of this very handsome and uncommon noctuid were taken "at light."

Mr. W. R. J. Piggott, a new collector in this district, did considerable collecting "at light" in the late summer and early fall and obtained many good things, amongst them being *Polia lubens* race *glaucopis* Hamp.; *Graptolitha dilatocula* Sm.; *Eumichtis versuta* Sm.; *Eremobia claudens* race *albertina* Hamp. (not common); *Pyrrhia umbra* race *exprimens* Walk. (very uncommon on Vancouver Island); *Melipotis versabilis* Harv. (rather rare on the Island); *Janassa pallida* Streck.; *Tolype dayi* Blackmore, a single male specimen. The distribution of this species is greater than I at first supposed, as, in addition to the Vancouver Island localities, I have seen a specimen taken by Mr. Cockle at Kaslo, and I have also found a rather poor male among some papered material taken by the late W. H. Danby at Rossland many years ago.

Maillardville.—Mr. L. E. Marmont, besides collecting a large number of "Micros," took the following desirable species: *Feralia columbiana* Sm.; *Graptolitha thaxteri* Grt., a very uncommon species; *Trachea indocilis* Wlk., a single specimen. This is a good capture as the species seems rather rare in British Columbia collections. The other recorded localities that I know of are Duncan (Day), Alberni (Redford), Kaslo (Cockle), Rossland (Danby), and Upper Columbia River (Dod). It may be more common than supposed, as it is probably confused in collections with *Trachea divesta* Grt., which it very much resembles, especially if the specimens are somewhat worn. *Autographa nichollæ* Hamp.; several specimens of this species were taken in May and again in September, thus indicating it to be double-brooded. There is no apparent difference between the two broods. It is also reported from Duncan (Day & Hanham) as having two broods in the season. *Euthyatira pudens* Gn. (peach-blossom moth); a single specimen of this handsome species was taken and a fine specimen of *Drepana bilineata* Pack. was bred ex pupa.

Amongst the Geometridæ, Mr. Marmont captured a nice specimen of that rare species *Cleora albescens* Hulst., and another specimen of *Lygris harveyata* Tayl. A short series of *Æthaloptera anticaria* race *fumata* B. & McD. was taken. The specimens taken by Mr. Marmot are considerably paler than those taken by Mr. Cockle at Kaslo, from which locality the species was described. A most peculiar incident of a butterfly being taken "at light" was related to me by Mr. Marmont. At 11.30 p.m. on the night of August 6th, while out collecting noctuids, he noticed a peculiar-looking moth (?) flying around an electric-light pole. Upon capturing it, it proved to be a specimen of *Phyciodes mylitta* Edw. This is the first instance I have heard of a butterfly being taken in this manner.

Lillooet.—Mr. A. W. Phair, who generally sends in some very desirable material, has not collected as much as usual this season, the cares of an increasing business having prevented him getting into the field as often as he has done in previous years. However, amongst the material sent in was a specimen of *Acronycta mansueta* Sm.; this is the first authentic specimen of this species that I have seen. It agrees perfectly with the description and figure (Proc. U.S.N.M., Vol. 21, page 100, and Plate XII., Fig. 7). Dyar in his "Kootenai List" records one specimen from Kaslo (Cockle), but a specimen sent to me by Mr. Cockle as this species is *A. grisea* race *revelleta* Sm.; *Acronycta strigulata* Sm., a rather worn specimen. This species was figured in Rep. Prov. Mus., 1920, Plate I.

Amongst the geometers was a specimen of *Dysstroma formosa* Hulst., a rather rare species. I have seen one other specimen previously from the same locality and one from Vavenby. During the second week of August Messrs. Day and Hanham spent six days camping on Mount McLean at an elevation of 5,000 feet. Several trips were made to an altitude of 7,500 feet, at which elevation many alpine insects were taken. The most noteworthy of the diurnals were: *Eurymus nastes* race *streckeri* Gr.; *Erebia vidleri* Elwes; *Strymon saepium* Bdv.; *Heodes cupreus* Edw.; and *H. heteronea* Bdv. A single specimen of *Euxoa colata* Grt. was taken. This is a most interesting record, as the species must be exceedingly rare. Dyar records one from Sandon, B.C., and a specimen is recorded from Mount Cheam, B.C. Two specimens of *Oncocnemis hayesi* Grt. were captured; this is a new locality for this species, Kaslo being the only previous record. Curiously enough, a specimen of *Autographa alta* Ottol. was taken, to which the same remark applies.

Princeton.—Mr. A. S. Thomson, who was with a surveying party in the mountains in this district, managed to pick up a few specimens, which included *Brenthis chariclea* Schneid and *Euphydryas anicia* D. & H. among the diurnals; *Diacrisia vagans* Bdv. and *Parasemia plantaginis* form *geometrica* Grt. in the arctiids. The only noctuid taken was a rather rubbed specimen of *Zale benesignata* race *largera* Sm. The species was described by Smith (Proc. U.S.N.M., Vol. 35, page 257, 1908) from two specimens, a male from Winnipeg, Man., and a female from Wellington, B.C. (G. W. Taylor). I have no record of any specimen of this species having been captured in the Province since the type was taken until Mr. Thomson secured this specimen, which was kindly identified for me by Dr. J. McDunnough. A single geometer was taken, *Macaria denticulata* race *sexpunctata* Bates. This is rather an uncommon species; it has been recorded from Chilcotin and Penticton.

Chilcotin.—Mr. E. R. Buckell, who has been studying the grasshopper situation in this district for the past two years under the direction of the Provincial Department of Agriculture, made a small collection of Lepidoptera which contained some very interesting species. The following are worthy of special notice: *Apantesis blakei* race *superba* Stretch; a single, rather faded *Schinia separata* Grt.; this species was recorded for the first time in Rep. Prov. Mus., 1920, page 19, from Spences Bridge, B.C. (Newcombe), as being new to the Province and a figure of it was given on Plate I. *Euxoa quadridentata* race *flutea* Sm.; this is a good record as it is a very rare species in the Province. *Graptolitha petulca* Grt.; this record extends the known range of this species, as it has hitherto only been recorded from the southern part of British Columbia (Vancouver Island to Kaslo); *Septis barnesi* Sm., a worn specimen; *Oligia tensa* Grt. (*see* "Illustrated Lepidoptera"); *Andropolia contacta* Wlk., a rare species, only previously known from Kaslo; and *Euclidimera annexa* Hy. Edw. Amongst the Geometridæ was a nice specimen of *Phasiane hebetata* Hulst. (*see* "Illustrated Lepidoptera"); *Lygris atrifasciata* Hulst., an uncommon species which occurs very sparingly in various localities; and *Platea trilinearia* Pack.; this exceedingly handsome geometer is more widely distributed than is generally supposed. For a number of years a single specimen taken by Mr. E. M. Skinner at Keremeos in May, 1894, was the only known record for British Columbia. During the last three or four years specimens have been recorded from Lillooet (Phair), Penticton (W. B. Anderson), and now from Chilcotin.

Barkerville.—During the middle of August a short time was spent in this district by Mr. Buckell, but owing to the extremely wet weather very few insects were taken; the most interesting amongst the geometers being *Itame brunneata* Thun., one specimen in nice condition being taken. This is a very rare species in British Columbia. I have one other specimen taken by the late R. V. Harvey from Similkameen in July, 1906. In Rep. Can. Arct. Exped., Vol. III., Pt. 1, page 44, Gibson records one specimen from Burwash Creek, Yukon Territory, taken in August, 1914 (D. D. Cairns), rather darker in colour than the Eastern specimens. I have also a single specimen from the Yukon-Alaska boundary taken by Theo. Bryant in 1908. This specimen is also much darker in ground colour than the two British Columbia examples I have mentioned; *Lygris destinata* Moesch (not common); *Eupithicia cretaceata* Pack.; this species has a very wide range in the Province, from Victoria in the south to Atlin in the far north and across the Province to West Kootenay. I am not at all sure but what they embrace one or two well-defined races; and *Xanthorhœ abrasaria* race *congregata* Walk.

Mr. Buckell also collected a short series of *Œneis beani* Elwes on Mount Bowman (7,500 feet) on July 9th. This species has been taken on a number of mountain ranges in the Province and probably occurs on every mountain of over 7,000 feet altitude. Mount Bowman is a high limestone ridge some 20 miles north-west of Clinton.

Enderby.—Mr. Downes has handed us a list of species identified by Dr. J. McDunnough which were taken by Mr. J. Wynne in the vicinity of Enderby. They include several good records, the best of them being *Tarache areli* Streck.; this pretty little noctuid is extremely rare. I have one specimen from Rossland (Danby) and it has been taken at Kaslo by Mr. Cockle. *Syneda ochracea* Behr.; this is another somewhat rare species, odd specimens having been taken at Vaseaux Lake (Treherne), Kaslo (Cockle), and Rossland (Danby). Amongst the geometers, *Trichodesia albovittata* race *tenuifasciata* B. & McD. is the most interesting. It was described (Cont. Lep. No. Amer., Vol., 3, No. 4, page 225) from Spirit Lake, Idaho. It differs from typical *albovittata* in having the white band of the primaries very much reduced in width. I have one specimen from Rossland (Danby).

Vavenby.—This locality is situated about 80 miles north of Kamloops in the valley of the Upper Thompson River. Mr. T. A. Moilliet and his son Ted, who is an enthusiastic collector, sent us a considerable quantity of material during the past season. As we had not previously received any material from this district, we were especially glad to get this, as it has extended our knowledge of the range of many common species, as well as furnishing us with specimens of rare species of which we had no previous representatives, including several new to the Province. Amongst the diurnals were specimens of *Basilarchia arthemis* race *rubrofasciata* B. & McD.; this species must be extremely isolated, as this makes only the third locality from which it has been recorded in eighteen years. The first was a single specimen taken by Mr. Dashwood-Jones at Halcyon Hot Springs, Kootenay Lake, in 1903, and then no further specimens were recorded until Mr. W. A. Newcombe took five in the Chilcotin District in 1915. *Incisalia polias* C. & W.; *Lycænopsis pseudargiolus* form *lucia* Kirby, and form *marginata* Edw.; these are the first specimens of these two forms that I have seen from this Province, although

I have two or three rather poor specimens taken in the Yukon by Mr. T. Bryant which are referable to the form *lucia*. In the Rep. Can. Arc. Exped., Vol. III., page 30, Mr. A. Gibson refers to specimens taken by G. M. Dawson at Dease Lake, B.C., in 1887, which Dr. Fletcher determined as representing the forms *lucia* Kby., *marginata* Edw., and *violacea* Edw. Dease Lake is situated some 60 miles north-east of Telegraph Creek.

In the Sphingidæ, *Smerinthus jamaicensis* f. norm *geminatus* Say. and *Hæmorrhagia thysbe* form *cimbiciformis* Steph. were the best. *Apantesis michabo* Grt. was the most desirable of the arctiids, while in the Noctuidæ the following are worthy of special mention:—

Euxoa plagigera Morr.; *Scotogramma trifolii* Rott., a single specimen which is the first I have seen of the typical form; it may occur at Kaslo, but I have not seen a specimen from there. Anyway, it is quite rare, as is also the race *albifusa* Walk., which occurs on Vancouver Island. A figure of the latter was given in Rep. Prov. Mus., 1916, Plate VII. *Polia farnhami* Grt.; *Bombycia rectifascia* Sm. (*see* "Illustrated Lepidoptera"); *Agroperina morna* Streck.; this is another rare species; the only other one I have seen was collected by Mr. G. O. Day at Cowichan Bay. *Andropolia ædon* Grt.; *Namangana præacuta* Sm.; and *Autographa flagellum* Walk.; this is rather an uncommon *Autographa* in British Columbia, as our previous records are from Agassiz and Kaslo. Amongst the geometers are *Lobophora montanata* race *magnoliatoidata* Dyar., previously taken at Kaslo (Cockle) and Rossland (Danby); *Dysstroma formosa* Hulst.; *Lygris destinata* race *schistacea* Warr.; a single specimen taken on August 30th matches exactly a specimen from Kaslo (Cockle), which was identified by Dr. McDunnough some years ago as this species. I have no other record of it. *Isturgia truncataria* Wlk.; *Itame sulphurea* Pack.; *I. plumosata* B. & McD.; *Euchlæna astylusaria* Wlk.; and one *Eulype hastata* race *subhastata* Nolc.; this race is rather rare in British Columbia collections, although it is rather widely distributed. We have specimens from Atlin, Prince Rupert, and Grouse Mountain, near Vancouver.

Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, who has collected in many different localities during the season, reports that collecting on the whole was decidedly poor, although several good days were experienced, notably May 24th at Penticton and August 15th at Fort Steele. The following are the best of his captures:—

Powell River.—*Eriopygea perbrunnea* Grt.; *Autographa mappa* G. & R.; and *Diactinia silaceata* race *albolineata* Pack.

Sechelt.—Several specimens of *Epargyreus tityrus* Fabr. were taken, but they were all badly worn as it was rather late for this species—August 6th, to be exact. This species has previously been recorded from Vancouver and Savary Island (R. S. Sherman), where it appears about the latter part of June. A specimen of *Selenia alciphearia* form *ornata* B. & McD. was also taken.

Penticton.—*Smerinthus cerisyi opthalmicus* form *pallidulus* Edw.; a single specimen of this uncommon form was taken; *Diacrisia pteridis* (*danbyi*) race *rubra* Neum; *Scotogramma oregonica* Grt.; and *Spodolepsis substriataria* race *danbyi* Hulst.

Fort Steele.—*Euxoa satiens* Sm.; a short series of this rare noctuid was taken in good condition "at light." In our local lists it is simply recorded from "B.C." I have one specimen from Lillooet (Phair) which is referable to this species. *Euxoa quadridentata* race *flutea* Sm.; *Oncocnemis albifasciata* Hamp.; this is also a rare species. A single specimen was taken some years ago by Mr. Anderson at Chilcotin (*see* "Illustrated Lepidoptera"); and *Zenophleps lignicolorata* Pack.

MICROLEPIDOPTERA.

We have continued our work in this group during the present season and have obtained a number of new records, including several new species. We have also extended our knowledge of the known range of a number of species that have been previously recorded.

Collections have been made at Victoria, Goldstream, Fitzgerald, Mount Tzouhalem, Maillardville, Mount McLean, Chilcotin, and Vavenby, which have resulted in the addition of much desirable material.

As a result of this activity the writer has been enabled to mount about 1,800 of these small moths during the past season, a great many of which have not previously been recorded.

In the Ann. Rep. Prov. Mus., 1920, pages 23 and 24, I gave a list of species taken in that year which were additional to those recorded in the 1906 B.C. Check-list. I am appending a further additional list of species taken during the present year, together with a few taken in 1920, the determinations of which were not to hand when the previous list was printed. Some of the species have been described since the 1906 Check-list was published; the majority are, however, new records for the Province and a few are new to science.

It is well to state here that this season's captures in the *Tineina* are not included, as they have not yet been worked up owing to the absence from Washington of Mr. August Busck, who is the foremost authority on this group in North America.

The numbers and arrangement are in accord with Messrs. Barnes & McDunnough's Check-list. Those marked with a star have been described since the "List" was published.

Collectors: W. B. Anderson, E. H. Blackmore, E. R. Buckell, W. R. Carter, G. O. Day, A. W. Hanham, L. E. Marmont, and T. A. Moilliet, whose initials only are used in the following records.

Pyralidæ (Pyraustinæ).

4994. *Evergestis subterminalis* B. & McD. Mount McLean (G. O. D.); Vavenby (T. A. M.).
4996. *Evergestis simulatalis* Grt. Fort Steele (W. B. A.); Mount McLean (G. O. D.).

Pyralidæ (Scopariinæ).

* *Scoparia basalis pacificalis* Dyar. Victoria (E. H. B.); Mount Newton (E. H. B.).
* *Scoparia commortalis* Dyar. Victoria (E. H. B.).

Pyralidæ (Schœnobiinæ).

5311B. *Schœnobius melinellus albicostellus* Fern. Alberni (J. Redford).

Pyralidæ (Crambinæ).

* *Crambus tutillus* McD. Victoria (W. R. C.; E. H. B.).

Pyralidæ (Phycitinæ).

5591. *Ambesa lætella* Grt. Chilcotin (E. R. B.).
5631. *Salebria virgatella subcæsiella* Clem. Goldstream (E. H. B.).
* *Pyla blackmorella* Dyar. Mount Tzouhalem (G. O. D.).

Pterophoridæ.

5862. *Platyptilia edwardsi* Fish. Mount McLean (G. O. D.; A. W. H.).
5881. *Platyptilia pallidactyla* Haw. Victoria (W. R. C.); Goldstream (E. H. B.).
Alucita montana declivis Meyr. Fort Fraser (W. B. A.).
5899. *Oidæmatophorus cineraceus* Fish. Mount McLean (G. O. D.); Vavenby (T. A. M.).
5907. *Oidæmatophorus homodactylus* Wlk. Mount McLean (G. O. D.; A. W. H.); Vavenby (T. A. M.).
Oidæmatophorus occidentalis Wlshm. Fort Steele (W. B. A.); Vavenby, (T. A. M.).
* *Oidæmatophorus corvus* B. & L. Goldstream (E. H. B.); Maillardville (L. E. M.).
5944. *Stenoptilia mengeli* Fern. Mount McLean (A. W. H.).

Gelechidæ.

6021. *Metzneria lappella* Linn. Victoria (E. H. B.).

Oecophoridæ.

6486. *Semioscopis aurorella* Dyar. Maillardville (L. E. M.).
6488. *Semioscopis inornata* Wlshm. Victoria (L. Clarke).

Aegeriidæ.

6758. *Paranthrene perlucida* Busck. Victoria (L. Clarke).

Eucosmidæ.

6770. *Evetria colfaxiana* Kearf. Fitzgerald (W. R. C.).
6803. *Exartema versicoloranum* Clem. Maillardville (L. E. M.).
6840. *Argyroploce mengelana* Fern. Vavenby (T. A. M.).
6842. *Argyroploce urticana* Hub. Maillardville (L. E. M.).
6869. *Argyroploce bipartitana* Clem. Maillardville (L. E. M.).
6885. *Eucosma argenteana* Wlshm. Chilcotin (E. R. B.).

6894. *Eucosma ridingsana* Rob. Vavenby (T. A. M.).
6948. *Eucosma radicana* Wlshm. Victoria (W. R. C.; E. H. B.).
6964. *Eucosma rectiplicana* Wlshm. Victoria (W. R. C.).
7013. *Eucosma illotana* Wlshm. Vavenby (T. A. M.).
7046. *Eucosma medoistriata* Wlshm. Chilcotin (E. R. B.).
7093. *Eucosma tarandana* Moesch. Chilcotin (E. R. B.).
7100. *Eucosma montanana* Wlshm. Chilcotin (E. R. B.).
7144. *Enarmonia pinicolana* Zell. Victoria (W. R. C.).
7146. *Enarmonia fasciolana* Clem. Goldstream (E. H. B.).
7152. *Enarmonia crispana* Clem. Vavenby (T. A. M.).
7182. *Ancylis intermediana* Kearf. Fitzgerald (W. R. C.) ; Ladysmith (E. H. B.) ; Maillardville (L. E. M.).
7193. *Ancylis apicana* Wlk. Fitzgerald (W. R. C.).
7204. *Ancylis kincaidiana* Fern. Maillardville (L. E. M.).
7212. *Laspeyresia vancouverana* Kearf. Fitzgerald (W. R. C.) ; Goldstream (E. H. B.).
7223. *Laspeyresia conversana* Wlshm. Fitzgerald (W. R. C.) ; Goldstream (E. H. B.).
7225. *Laspeyresia lunatana* Wlshm. Victoria (E. H. B.).
7228. *Laspeyresia zana* Kearf. Mount Tzouhalem (E. H. B.).
7237. *Laspeyresia trossulana* Wlshm. Victoria (W. R. C.).
7244. *Laspeyresia americana* Kearf. Ladysmith (E. H. B.).
7247. *Laspeyresia prosperana* Kearf. Goldstream (E. H. B.).
7260. *Hemimene sedatana* Busck. Mount Tzouhalem (E. H. B.).

Tortricidæ.

* *Cacœcia dimorphana* B. & B. Victoria (W. R. C.).
7405. *Tortricodes horariana* Wlshm. Victoria (W. R. C.).

Phaloniidæ.

7540. *Hysterosia aureoalbida* Wlshm. Chilcotin (E. R. B.).

Glyphipterygidæ.

7619. *Choreutis balsamorrhizella* Busck. Chilcotin (E. R. B.).

Plutellidæ.

7638. *Euceratia securella* Wlshm. Victoria (W. R. C.).
7674. *Plutella vanella* Wlshm. Victoria (E. H. B.).

Incurvariidæ.

8428. *Incurvaria oregonella* Wlshm. Fitzgerald (W. R. C.) ; Chilcotin (E. R. B.) ; Cheakamus (W. B. A.).

Hepialidæ.

8483. *Sthenopis purpurascens* Peck. Vavenby (T. A. M.).

Among those species which have been previously listed, the following, with notes thereon, may prove of interest:—

5087. *Perispasta cæculalis* Zell. Two specimens of this rather uncommon pyraustid were taken by Mr. W. R. Carter at Fitzgerald on June 12th and July 3rd respectively, and a single specimen was taken by Mr. W. B. Anderson at Chase on June 18th.

5093. *Phylctænia itysalis* Walk. This species has a much wider distribution in British Columbia than was at one time supposed. A short series was taken on Mount McLean (A. W. H.) at an altitude of 5,000 feet and a few specimens were taken at Vavenby (T. A. M.). It has been taken at Kaslo (J. W. C.) and we have specimens taken at Atlin (E. M. Anderson).

5143. *Pyrausta semirubralis* Pack. A long series of this pretty ruby and fawn coloured species was taken by Mr. W. R. Carter at Fitzgerald on various dates in June. It occurs at many points on Vancouver Island and has been recorded from Vancouver (R. V. Harvey), but we do not possess any records of its occurrence in the Interior.

5361. *Crambus hortuellus* Hubn. Previous to this season we have only had odd specimens of this species—Victoria (E. H. B.) ; Vancouver (R. V. Harvey) ; Lillooet (A. W. Phair)—but on June 15th Mr. W. R. Carter took a long series in good condition on Gonzales Hill. The majority were of the dark form (*vachellellus* Kearf.), but two or three were as light as Zeller's *topiarius*. It seems to me that *vachellellus* and *topiarius* should be regarded as "forms" and not "races," as the dark, light, and typical forms all occur together.

5369. *Crambus plumbifimbriellus* Dyar. This species was described from sixteen specimens taken by Dyar at Kaslo in 1903. We have had no other record of it until Mr. Buckell took a single specimen at Chilcotin on July 15th, 1920. During the present season two specimens were taken at West Summerland by Mr. J. W. Richmond on June 20th, and a single specimen was taken by Mr. L. E. Marmont at Fraser Mills on July 27th. The latter is rather an unexpected locality for this species.

5583. *Promylea lunigerella* Rag. This is apparently a rather rare species. One specimen was taken by the writer at Victoria on July 17th, 1917; another specimen on Mount Newton, August 1st, 1920; and I took a third specimen on August 22nd of this year. I have not seen any others. It was described from "Vancouver Island" by Ragonot in 1887.

* *Carcina quercana* Fab. In last year's Report, page 31, this species was recorded by the writer as being new to North America. Meyrick (Handb. Brit. Lep., 1905) gives apple as one of its food-plants, and a sharp look-out was kept on the apple-trees in my garden for both larvæ and pupæ, but none was found. On July 15th, about 8 p.m., I noticed a newly emerged adult resting on the leaf of a large spreading shrub which is trained up the front of the house. An extended search for further specimens resulted in finding several pupæ spun up on the leaves of this shrub which turned out to be *Cotoneaster pyracantha* Linn., commonly known as fire-thorn or Christ's-thorn. (Upon investigation I found that this particular shrub was purchased from a local nurseryman and planted in the garden about seventeen years ago). A further search was made the next evening and altogether some twenty pupæ were obtained. Meyrick (*ibid.*, page 613) states that the pupæ spin a flat web beneath the leaves; I found that they spun their webs both on the upper and the lower surface of the leaves in about equal proportions. The pupa is of a bright golden-brown and the web is of thick white silk. The moths began to emerge about the 20th and continued to do so for several days. Several of the pupæ were parasitized and two hymenopterous species were bred out. These have been determined by Mr. R. A. Cushman, of the U.S. National Museum, as *Ephialtes sanguinicipes* Cress. and *Itoplectis pacificus* Cush.

6448. *Agnopteryx rosaciliella* Busck. Two specimens of this uncommon œcophorid were taken at Fraser Mills by Mr. Marmont on April 17th.

6459. *Agnopteryx argillacea* Wlshm. A single specimen was taken by Mr. W. R. Carter at Fitzgerald on March 28th.

6836. *Argyroploce galaxana* Kearf. The writer took a long series of this pretty little moth on Mount Tzouhalem on May 24th. It was described (Trans. Am. Ent. Soc., XXXIII., 9, 1907) from two specimens taken at Vernon, B.C., and one from Victoria, B.C.

6864. *Argyroploce campestrana* Zell. Four specimens were taken by Mr. Hanham on Mount McLean in August, and Mr. Moilliet took two at Vavenby on July 3rd. Dr. Dyar records taking it at Kaslo and states that the larvæ occurred on the common thimble-berry (*Rubus nutkanus*).

7263. *Hemimene britana* Busck. The writer took a long series of this species at Goldstream on June 1st to 3rd. It was easily started up in the evenings from patches of red clover alongside the railway-track. A peculiar feature was that during the daytime no amount of beating would disturb them, only one individual being taken in two attempts, although an hour before sunset the slightest tap would start four or five up immediately. The species was described (Proc. Biol. Soc. Wash., XIX., 178, 1906) from specimens taken by Dr. Dyar at Kaslo in 1903. Dyar in his "Kootenai List," page 929, recorded it under the name of *alpinana* Treitschke, but Mr. Busck states in his description that it is quite distinct from the European species.

7342. *Cacœcia persicana* Fitch. Of this handsome dark-red and ochre species the writer took a single specimen at Goldstream on July 2nd, and Mr. Marmont took another individual at Fraser Mills on June 16th. We have specimens from Wellington (Bryant) and Rossland (Danby). The species is apparently more plentiful at Kaslo.

7426. *Peronea variana* Fern. This exceedingly variable species seems rather uncommon in British Columbia. Mr. Marmont took two specimens at Fraser Mills on September 26th. It is recorded from Kaslo (Cockle); Field (Dyar); and Mr. Hanham has taken two or three specimens at Duncan.

PLATE III.

NOCTUIDÆ.

Euxoa excellens infelix Sm.
Fort Steele, B.C. (W. B. Anderson).
(New to British Columbia.)

Acronycta radcliffei Harvey.
Duncan, B.C. (G. O. Day).
(Rather rare.)

Oligia tonsa Grt.
Kaslo, B.C. (J. W. Cockle).
(Rather rare.)

Lampra nefascia Sm.
Victoria, B.C. (E. H. Blackmore).
(Previously misidentified.)

Eriopyga bostura Sm.
Kalso, B.C. (J. W. Cockle).
(New to British Columbia.)

Sympistis zetterstedti labradoris Staud.
Mount McLean, B.C. (A. W. Hanham).
(New to British Columbia.)

Tæniosca discivaria Wlk.
Vavenby, B.C. (T. A. Moilliet).
(New to British Columbia.)

Trachea inordinata montana Sm.
Chilcotin, B.C. (E. R. Buckell).
(New to British Columbia.)

Oligia tonsa subjuncta Sm.
Chilcotin, B.C. (E. R. Buckell).
(Very rare.)

Bombycia rectifascia Sm.
Vavenby, B.C. (T. A. Moilliet).
(Rather rare.)

Bombycia curvifascia Sm.
Fraser Mills, B.C. (L. E. Marmont).
(New to British Columbia.)

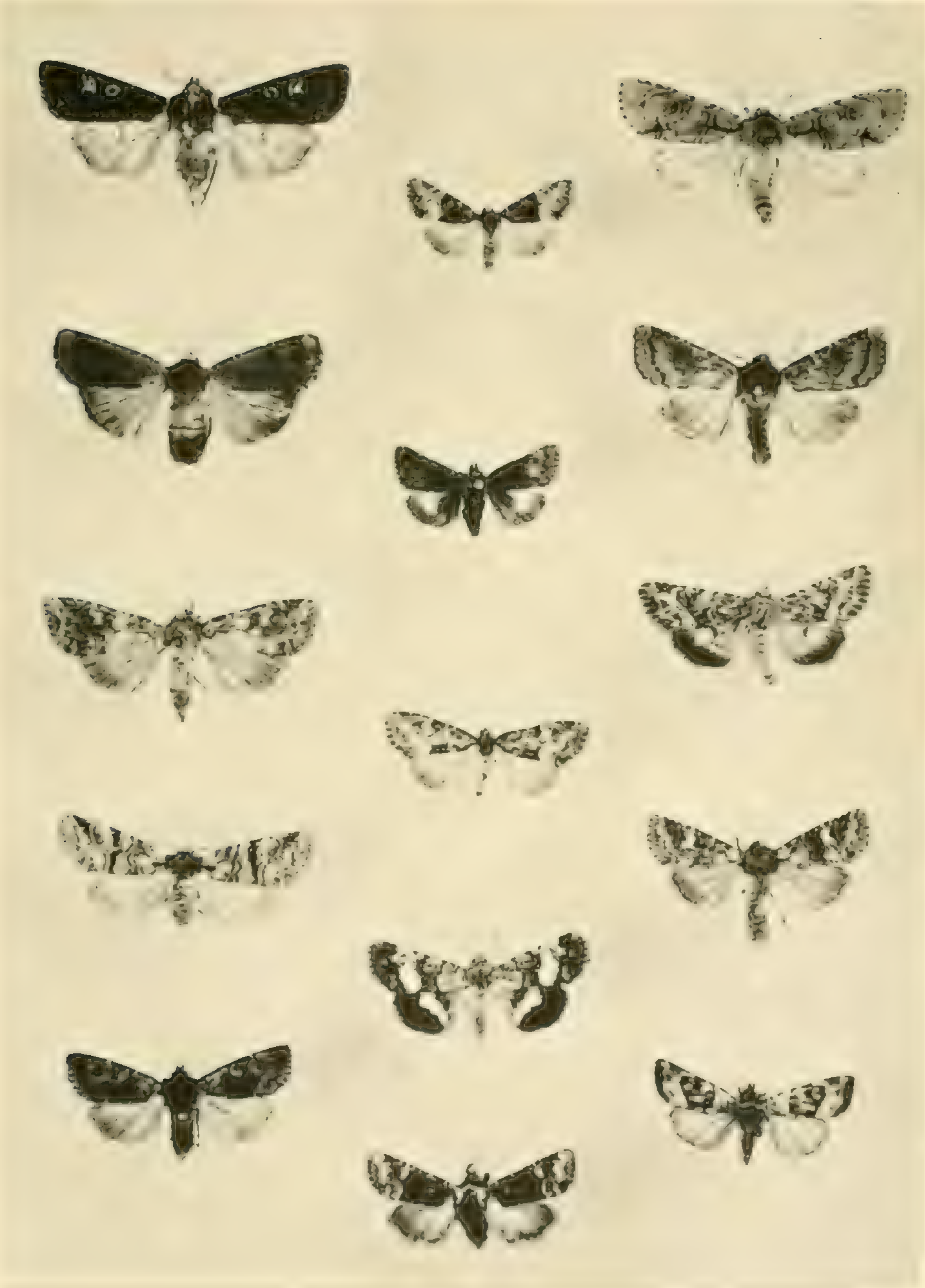
Oncocnemis albifasciata Hamp.
Chilcotin, B.C. (W. B. Anderson).
(Very rare.)

Euxoa rufula Sm.
Mount McLean, B.C. (A. W. Hanham).
(New to British Columbia.)

Orosagrotis incognita Sm.
Mount McLean, B.C. (A. W. Hanham).
(New to British Columbia.)

Polia olivacea davena Sm.
Kaslo, B.C. (J. W. Cockle).
(New to British Columbia.)

PLATE III



7604. *Allononyma vicarialis* Zell. The writer took two specimens in beautiful condition on April 17th at Fitzgerald and two specimens at Goldstream on May 30th, the latter being rather worn. This is the same insect which Dr. Dyar described as *A. diana* var. *betuliperda* and which is listed in our 1906 Check-list from Kaslo. An examination of Zeller's type in Lord Walsingham's collection by Mr. Busck (Pro. Ent. Soc. Wash., XI., 97, 1909) in 1908 proved that *vicarialis* and *betuliperda* were conspecific.

Illustrated Lepidoptera.

Noctuidæ (Plate III.).

1226. *Orosagrotis incognita* Sm. The specimen illustrated was taken on Mount McLean, near Lillooet, B.C., at an altitude of 5,000 feet by Mr. A. W. Hanham on August 21st, 1920. It was described (Trans. Am. Ent. Socy., Vol. XXI., page 52, 1894) from two males taken at Laggan, Alta., by Bean at an altitude of 7,000 feet. In Smith's description he gives the locality as Laggan, British Columbia. It is as well to note here that the majority of Smith's earlier references to British Columbia and to "North-west B.C." really refer to Northern Alberta. That is the reason why so many of his species still stand in our local lists as "B.C." without any further specific localities. Mr. Hanham says that the species was not at all uncommon, but unfortunately most of the specimens taken were somewhat worn.

1274. *Euxoa rufula* Sm. This species was also taken by Mr. Hanham at the same time and place, but was much more scarce than the preceding. It was described (Pro. U.S.N.M., X., 461, 1887) from a single male taken by Professor Snow in New Mexico at an altitude of 7,000 feet. Dr. A. W. Lindsey, who kindly identified it, states that the Mount McLean specimen is darker than specimens from Wyoming in the Barnes collection.

1364A. *Euxoa excellens* race *infelix* Sm. Taken by Mr. W. B. Anderson at Fort Steele on August 15th, 1921. It was described (Trans. Amer. Ent. Socy., XVII., page 57, 1890) from California as a distinct species, but later (Cat. Noct., 1893) Smith placed it as a synonym of *excellens*. It has been rescued from the synonymy by Barnes & McDunnough, who have placed it as a race of *excellens*. The maculation is practically the same, but *infelix* is of an even dark colour in contradistinction to the contrasting shades of the typical form. Mr. Cockle has also taken a single specimen at Kaslo.

1584. *Lampra* (*Rhynchagrotis*) *nefascia* Sm. (not *negascia* as listed, *vide* Benjamin, Bull. So. Calif. Acad. Sci., XX., 100, Dec., 1921). This species has never been properly placed in British Columbia collections. It has generally been placed under the name of *anchocelioides* Gue.; sometimes under *alternata* Grt. The majority of the specimens that I have seen are of a very even brownish-grey, with the terminal area distinctly paler. The species comes commonly to "sugar" at Duncan and I have taken it "at light" at Victoria and Goldstream in September. Mr. Foster H. Benjamin, who has recently revised this difficult genus, has kindly gone over my material in this group, and our British Columbia species are now more accurately placed than was previously the case.

1755G. *Polia olivacea* race *davena* Sm. Taken by Mr. J. W. Cockle at Kaslo on June 22nd, 1910. Amongst some material sent to us for examination by Mr. Cockle was this specimen, which seemed distinct from any of the five named varieties which are in the Museum collection. It was submitted to Dr. Lindsey, who identified it as *davena* Sm. It seems closer to *comis* Grt. than to any other named form, but the pale areas are not so light or so well defined, so that *davena* is not so contrasty in appearance as *comis*.

1828. *Eriopyga bostura* Sm. The specimen figured was taken by Mr. Cockle at Kaslo on August 21st, 1913. It does not appear to have been taken in any other locality in British Columbia. The only reference that I can find of this species in the literature that I have at hand is a note by Wolley-Dod in Bull. B.C. Ent. Soc., No. 10, June, 1908. Under the heading of "Additions" he lists *Graphipora bostura* Sm. (Ann. N.Y. Ac. Sci., XVIII., 103). Type from Kaslo.

2022. *Oncocnemis albifasciata* Hamp. This is the most striking of the British Columbia species of this genus. The specimen figured was taken by Mr. W. B. Anderson at Chilcotin on August 26th, 1918. The same collector took the species again at Fort Steele on August 15th, 1921. Sir George Hampson lists it "from North-west British Columbia."

2117. *Bombycia curvifascia* Sm. Taken by Mr. L. E. Marmont at Maillardville, B.C., on August 10th, 1920. This is the first specimen of this species that I have any record of from

British Columbia. It was described from California (Trans. Am. Ent. Soc., XVIII., 109, 1891). Dr. Lindsey, who kindly determined this specimen, states that there is one specimen in the Barnes collection from Victoria, B.C., which has been identified as *B. thula* Strecker.

2120. *Bombycia rectifascia* Sm. The specimen figured was taken at Vavenby, B.C., by Mr. T. A. Moilliet on August 14th, 1921. The species has been taken at Kaslo by Mr. Cockle, and Mr. Day has taken a specimen at Duncan, which was determined by Wolley-Dod as this species with a question-mark. I have not had an opportunity to compare Mr. Day's specimen with the one from Vavenby.

2201A. *Sympistis zetterstedti* race *labradoris* Staud. Taken by Mr. Hanham on Mount McLean on August 21st, 1920. This is a fine record as the species is arctic. It was described from Labrador. It is very rare in North American collections.

2275A. *Trachea inordinata* race *montana* Sm. This specimen was taken by Mr. E. R. Buckell at Chilcotin, B.C., on May 30th, 1920. This is another good record and adds another name to our list. It was described (Proc. U.S.N.M., XIII., 444, 1890) from Colorado.

2342. *Oligia tonsa* Grt. Taken by Mr. Cockle at Kaslo, B.C., on August 1st, 1907.

2342A. *Oligia tonsa* race *subjuncta* Sm. Taken by Mr. Buckell at Chilcotin, B.C., on August 1st, 1920. I have taken these two forms together, as there has been considerable doubt expressed at different times as to their specific identity. The former was described by Grote (Can. Ent., XII., 214, Oct., 1880) from Nevada as *Hadena tonsa*. The latter by Smith (Can. Ent., XXX., 323, Dec., 1898) from Colorado and Calgary, Alta. (Dod), as *Hadenella subjuncta*. In Bull. 52, U.S.N.M., 1902, Dyar sinks *subjuncta* as a synonym of *minuscula* Morr., but Dr. Smith, in Trans. Am. Ent. Soc., XXIX., 194, states that it has nothing to do with *minuscula*, but it is really a synonym of *tonsa* Grt. Dyar, in Proc. U.S.N.M., XXVII., 809, apparently agrees with this and records *tonsa* from Kaslo, B.C., and states that the specimens agree with the type of *subjuncta*. Wolley-Dod, in Can. Ent., XLIII., 152, May, 1911, discusses the matter at some length, but believes that *tonsa* and *subjuncta* are distinct. Barnes & McDunnough have listed (Check-list, Lep. Bor. Amer., 1917) *subjuncta* as a race of *tonsa*, a proceeding which seems a far more satisfactory solution.

I submitted the Kaslo specimen to Dr. Lindsey as *tonsa* Grt., and he kindly verified my determination. I have carefully compared Mr. Buckell's specimen with the description and it agrees in all essential particulars. It also agrees fairly well with Holland's figure on Plate XIX., Fig. 25. I have specimens from Nordegg, Alta. (Bowman), which match exactly the Chilcotin specimen. They were sent to me as *tonsa*.

2364. *Tæniosea discivaria* Walk. Taken by Mr. Moilliet at Vavenby on July 28th, 1921. As far as I know, this is a new record for British Columbia. It varies considerably in depth of colouring, one specimen showing considerable red shading.

2470. *Acronycta radcliffei* Harv. The specimen figured was taken at Quamichan Lake, near Duncan, by Mr. G. O. Day on June 12th, 1908. This is a rare species in British Columbia. It is very close in general habitus to *A. grisea revellata* Sm. Mr. Day's specimen agrees with the description (Proc. U.S.N.M., XXI., 107, 1899) and with the figure given on Plate XII., Fig 4. It was listed in the 1904 B.C. Check-list from Kaslo, B.C., but Dyar did not record the species in his "Kootenai List," and it was omitted, probably intentionally, from the 1906 B.C. Check-list. Mr. Cockle has a specimen which has been identified by Dr. McDunnough as this species. I have no other records of it, although it may be confused with *revellata* in some collections. *Radcliffei* is a much narrower-winged species and the course of the t.p. and s.t. lines are different. In *radcliffei* the t.p. line is broadly outcurved from costa, while in *revellata* it is only slightly oblique, with the s.t. line parallel, at least superiorly.

Geometridæ (Plate IV.).

3997. *Dysstroma cthela* Hulst. The specimen figured was taken by the writer at Goldstream, B.C., on July 3rd, 1921. It is rather a rare species and this is the first specimen that I have taken; it is the most perfect specimen I have seen of this species. It is closely allied to *D. casloata* Tayl., but can generally be separated from the latter by the narrower median band and the absence of the extra-basal bar. It has been taken at Wellington (Bryant), Duncan (Day & Hanham), and I have seen one specimen taken at Victoria (Meugens, 29, VI., 20). Described by Hulst (Trans. Am. Ent. Socy., XXIII., 283, 1896) from a single male taken at Sierra Nevada, Cal.

4009E. *Hydriomena nubilofasciata* form *vulnerata* Swett. This species is new to the Province and was taken by Mr. W. Downes at Sluggett's, V.I., on March 1st, 1921. Some years previously Mr. Downes, who was then living in that locality, noticed a species of *Hydriomena* occurring in February which was apparently different from any of our known spring species in that genus. Owing to various causes no opportunity offered until this spring to investigate the matter, when a nice series was taken with the aid of a lantern. *Nubilofasciata* Pack. has six described forms or races, all of which are colour forms (*vide* Swett, Can. Ent., XLIII., 79, 1911); this species can at once be differentiated from any other British Columbia species by the dark marginal band of primaries. Mr. Swett in his notes states that he has the species from British Columbia amongst a number of widely spread localities, but he does not give any specific locality, neither does he refer to any particular form.

4192. *Eupithecia interruptofasciata* Pack. The specimen figured was taken by Mr. G. O. Day at Maple Bay, near Duncan, B.C., in August, 1913. This species has not been hitherto recorded from British Columbia. It is an inhabitant of the Atlantic States and was described in Fifth Rept. Peab. Acad. Sci., 59, 1873. Mr. Day states that it is rather rare and very local; he has not taken it in any other locality in the vicinity, excepting Maple Bay.

4209. *Eupithecia mutata* Pears. Taken by the writer at Goldstream on July 2nd, 1921. This is one of the rarer species of this genus. The only other specimen that I have seen is a rather worn individual taken by myself in a pine woods near Victoria on July 18th, 1913. The specimen figured is in good condition and was obtained by "beating" in a heavily wooded (chiefly Douglas fir) district. It agrees with Pearsall's description (Journ. N.Y. Ent. Soc., XVI., 98, June, 1908). The species was described from the Catskill Mountains, New York State. It is closely allied to *albicapitata* Pack., which is also a rare species in the Province, our only records being Cowichan Lake (Day) and Kaslo (Cockle).

4223. *Eupithecia scabrogata* Pears. This is another new record to add to the already long list of *Eupithecias* (about fifty) recorded from British Columbia. It was taken by Mr. Theo. Bryant at Wellington, B.C., on April 16th, 1903. One other specimen taken on March 24th of the same year is not in such good condition. It is quite distinct from any other species that we have. The determination was made for us by Mr. L. W. Swett.

4316-1. *Drepanulatrix secundaria* B. & McD. Taken by Mr. Cockle at Kaslo, B.C., on June 14th, 1910. At first thought to be a new species. It, however, agrees with the description (Cont. Lep. No. Amer., Vol. III., No. 1, page 25, Nov., 1916) of *secundaria*, and Dr. Lindsey, who compared it with the types, believes it to be this species, although it is rather far north. The species was described from Mineral King, Cal.

4374. *Phasiane hebetata* Hulst. Taken at Chilcotin, B.C., by Mr. E. R. Buckell on July 16th, 1921. This is the first specimen of this species in good condition that I have seen. We have had two specimens previously—one from Atlin (E. M. Anderson) and the other from Chilcotin (W. A. Newcombe)—that were referable to this species, but were so denuded of scales as to make accurate identification impossible. The course of the extra and intra-discal lines are exactly the same as Barnes & McDunnough's figure (Cont. Lep. No. Amer., Vol. III., No. 4, Plate XXII., Fig. 9) of *demaculata*, which the authors later (*ibid.*, Vol. IV., No. 2, page 149) sunk as a synonym of *hebatata*. Mr. Buckell's specimen agrees with the description and the figure mentioned. The type material of *demaculata* also included a specimen from Field, B.C. The species has a wide range, but is rare in British Columbia.

4425. *Itame pustularia* Hub. This is another very rare species in British Columbia. The specimen figured was taken by Mr. A. W. Phair at Lillooet, B.C., on June 29th, 1920. The only other specimen that I know of in the Province is a specimen taken at Kaslo by Mr. Cockle many years ago. It occurs throughout the Atlantic States and I have specimens from Manitoba. It has not been recorded from Alberta.

4453. *Dysmigia loricaria* Evers. This species is new to the Province. A nice series was taken by Mr. T. A. Moilliet at Vavenby, B.C., during the middle of July, 1921. It was recorded in the 1904 B.C. Check-list under the name of *Symphcrta Julia* Hulst., and the localities given are Rocky Mountains and Kaslo (?). I have seen all Mr. Cockle's species and he has not taken it. The species was left out in the 1906 List. Some specimens, especially if a little rubbed, closely resemble *Itame exauspicata* Wlk., which also occurs in the same district. The females are wingless.

Pyralidæ (Pyraustinæ).

4994. *Evergestis subterminalis* B. & McD. Taken on Mount McLean by Mr. G. O. Day on August 8th, 1921. Very close to *funalis* Grt., which also occurs in British Columbia. The latter is taken at Kaslo and I have a specimen from Vavenby (T. A. Moilliet). It is recorded in the 1906 Check-list from Vancouver Island, but this is an error. A specimen from Wellington (Bryant) labelled *funalis* is undoubtedly *insulalis* B. & McD., which occurs at several points on the Island.

4996. *Evergestis simulatalis* Grt. This pretty species was taken by Mr. W. B. Anderson at Fort Steele, B.C., on August 15th, 1921. Mr. Day also took a single specimen on Mount McLean on August 10th. Dyar lists the species from Arizona and Colorado.

Pyralidæ (Scopariinæ).

**Scoparia basalis* race *pacificalis* Dyar. Described (Ins. Ins. Mens., IX., 66, 1921) as a new race from specimens, three taken by the writer at Victoria and Mount Newton and one taken at Grayland, Wash. (H. K. Plank) ; it occurs from mid-July to mid-August. The specimen figured is one of the co-types and was taken on Mount Newton on August 1st, 1920. *Fernaldalis* Dyar is now placed as a race of *basalis*. Dyar in his "Kootenai List" records taking a long series of *fernaldalis* at Shawnigan Lake, B.C. It is also recorded from Kaslo, B.C.

**Scoparia commortalis* Dyar. This new species was described (*Ibid.*, page 67) from specimens taken by the writer at Victoria, B.C., July 15th to 17th, 1920. This species is quite distinct from any other of our British Columbia scoparids and is easily recognizable by its generally brown appearance and the presence of a broad dark-brown band which follows the pale outer line. One of the male co-types is figured.

5248. *Scoparia tricoloralis* Dyar. Taken by Mr. L. E. Marmont at Maillardville, B.C., on July 13th, 1921. This does not appear to be a common species by any means, although it is recorded from several points—Wellington (Bryant), Duncan (Skinner), Ainsworth (Dyar), and Kaslo (Cockle). It is the most brightly coloured of the British Columbia species and is rather a pretty insect. Mr. Marmont took three specimens on the 13th and one on the 26th, but it was not observed between those dates, although it was searched for. He did not take any the previous year.

Pyralidæ (Crambinæ).

**Crambus tutillus* McDun. The specimen figured is a male paratype kindly returned to me by Dr. McDunnough. It was taken by the writer on May 28th, 1918. This species is very common in Victoria, generally occurring about the middle of May. It is very close to *dissectus* Grt. and had previously been determined for me as this species, under which name it was listed on page 24, Prov. Mus. Rep., 1920. This is the same insect that was listed in the 1904 B.C. Check-list as "*dumetellus* Hub. Generally distributed (common)." I have seen specimens in the Bryant collection labelled *dumetellus* which are undoubtedly McDunnough's new species. Dr. McDunnough in his description states that "It (*tutillus*) is probably closest to *dumetellus* Hub., differing in the much shorter and less distinct white costal line." Dr. Fernald in his "Crambidæ of North America," 1896, gives a coloured figure of *dissectus* (Plate II., Fig. 12) and one of *dumetellus* (Plate III., Fig. 2), and a comparison of these figures with specimens of *tutillus* shows that the latter is closer to *dumetellus* than it is to *dissectus*.

Pyralidæ (Phycitinæ).

**Pyla blackmorella* Dyar. Described by Dr. Dyar (Ins. Ins. Mens., 68, 1921) from two specimens taken by the writer on Mount Tzouhalem, near Duncan, B.C., on June 24th, 1913. A figure of the male paratype is given. The writer in company with Mr. G. O. Day climbed Mount Tzouhalem on May 24th of the present year, but we were about three weeks too soon for this species. Mr. Day, however, secured a nice series on June 13th. It has not been recorded from any other locality.

Oecophoridæ.

6486. *Semioscopis aurorella* Dyar. The specimen figured was taken by Mr. L. E. Marmont at Maillardville, B.C., on March 4th, 1921. Another specimen was taken on the 14th of the same month. These two specimens are the only records that we have of this species in the Province.

PLATE IV.

GEOMETRIDÆ.

Hydriomena nubilofasciata vulnerata Swett.
Sluggett, B.C. (W. Downes).
(New to British Columbia.)

Eupithecia interruptofasciata Pack.
Maple Bay, B.C. (G. O. Day).
(New to British Columbia.)

Dysmigia loricaria Evers.
Vavenby, B.C. (T. A. Moilliet).
(New to British Columbia.)

Drepanulatrix secundaria B. & McD.
Kaslo, B.C. (J. W. Cockle).
(New to British Columbia.)

Eupithecia mutata Pears.
Goldstream, B.C. (E. H. Blackmore).
(Very rare.)

Phasiane hebetata Hulst.
Chilcotin, B.C. (E. R. Buckell).
(Rather rare.)

Dysstroma ethela Hulst.
Goldstream, B.C. (E. H. Blackmore).
(Rather rare.)

Eupithecia scabrogata Pears.
Wellington, B.C. (T. Bryant).
(New to British Columbia.)

Itame pustularia Hubn.
Lillooet, B.C. (A. W. Phair).
(Very rare.)

MICROLEPIDOPTERA.

Evergestis simulatalis Grt.
Fort Steele, B.C. (W. B. Anderson).
(New to British Columbia.)

Eretria colfaxiana Kearf.
Fitzgerald, B.C. (W. R. Carter).
(New to British Columbia.)

Evergestis subterminalis B. & McD.
Mount McLean, B.C. (G. O. Day).
(New to British Columbia.)

Scoparia commortalis Dyar.
(Male co-type.)
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Scoparia basalis pacificalis Dyar.
(Male co-type.)
Mount Newton, B.C. (E. H. Blackmore).
(New to science.)

Semioscopis aurorella Dyar.
Fraser Mills, B.C. (L. E. Marmont).
(New to British Columbia.)

Enarmonia pinicolana Zell.
Victoria, B.C. (W. R. Carter).
(New to British Columbia.)

Pyla blackmorella Dyar.
(Male paratype.)
Mount Tzouhalem, B.C. (E. H. Blackmore).
(New to science.)

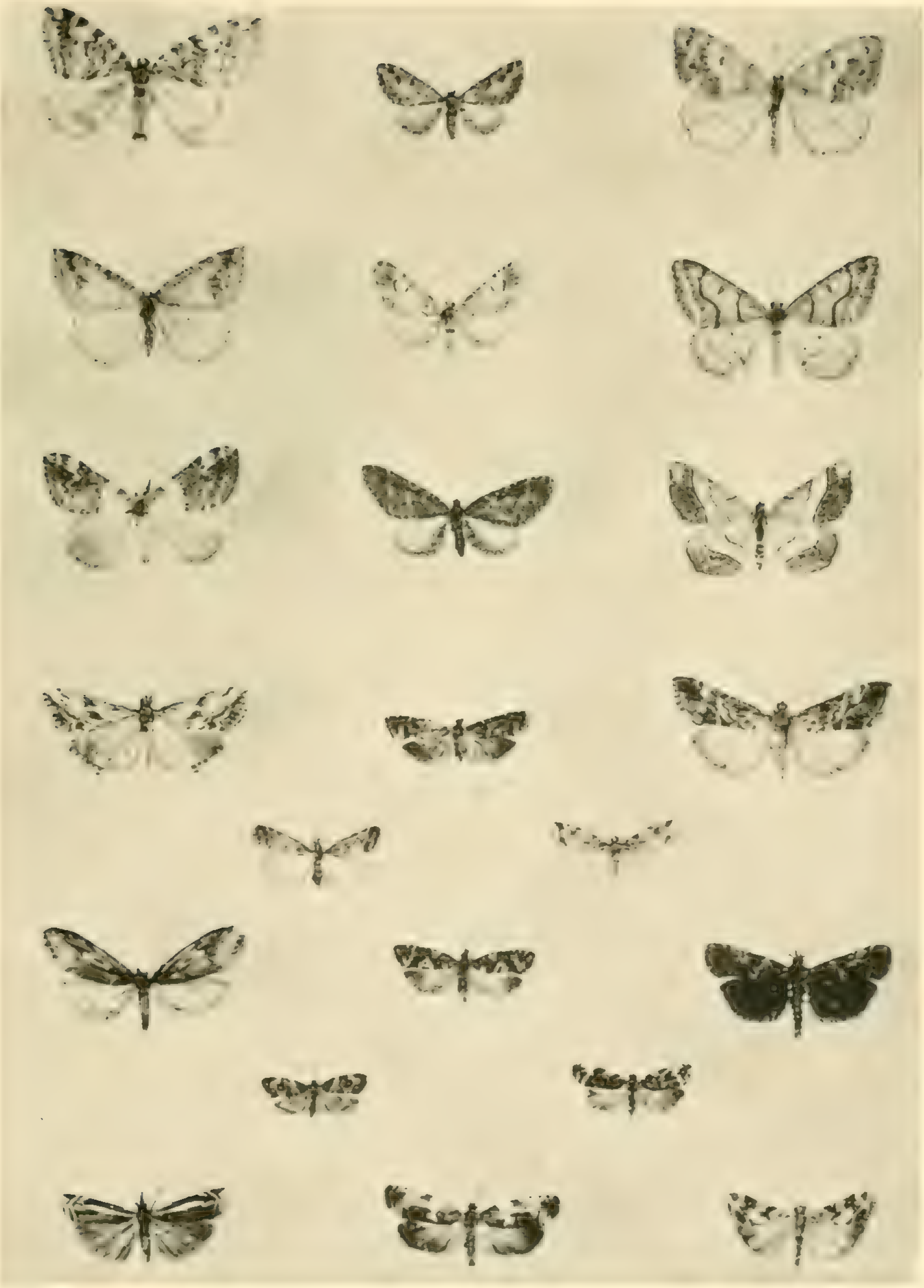
Choreutis balsamorrhizella Busck.
Chilcotin, B.C. (E. R. Buckell).
(New to British Columbia.)

Argyroploce mengelana Fern.
Vavenby, B.C. (T. A. Moilliet).
(New to British Columbia.)

Crambus tutillus McD.
(Male paratype.)
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Argyroploce duplex Wlsm.
Victoria, B.C. (W. R. Carter).
(Very local.)

Scoparia tricoloralis Dyar.
Fraser Mills, B.C. (L. E. Marmont).
(Rather uncommon.)



Eucosmidæ.

6770. *Eretria colfaxiana* Kearf. Taken by Mr. W. R. Carter at Fitzgerald, B.C., on April 17th, 1921. A short series of five specimens was taken on this date and a single specimen on May 8th. This species has not hitherto been recorded from the Province. Kearfott (Trans. Am. Ent. Soc., XXXIII., 3, 1907) described the species from a single male taken at Colfax, Cal.

6840. *Argyroploce mengelana* Fern. This is a good record and is new to British Columbia. A single specimen, luckily in good condition, was taken at Vavenby, B.C., by Mr. T. A. Moilliet on July 12th, 1921. It was described (Ent. News. V., 131, 1894) from ten specimens in poor condition taken by Mr. L. W. Mengel in North Greenland in 1891.

6859. *Argyroploce duplex* Wlshm. A nice series of this handsome eucosmid was taken by Mr. W. R. Carter from June 21st to 28th, 1921. It is exceedingly local and was only taken in a very small area. They were all taken "at rest" on a board fence bordering a small grove of aspen, which is undoubtedly their food-plant. Dr. Dyar in his "Kootenai List" records finding the larvæ of this species on aspen at Kaslo. It has not been recorded from any other locality in the Province. I have seen one other specimen taken by Mr. Hanham at Victoria, B.C., many years ago. It was described (Trans. Ent. Soc., Lond., 501, 1895) from Colorado.

7144. *Enarmonia pinicolana* Zell. The specimen illustrated was taken at Victoria, B.C., by W. R. Carter on July 20th, 1921. It is rather uncommon. Mr. Carter has taken two specimens and the writer took one in July, 1918. It bears a close superficial resemblance to some forms of *Eucosma solandriana* Linn. The species was described by Zeller in 1846 and is widely distributed. Meyrick (Handb. Brit. Lep., 474, 1895) gives its distribution as Great Britain, North and Central Europe, and North Asia, and its food-plant as larch.

Glyphipterygidæ.

7619. *Chorentis balsamorrhizella* Busck. Taken by Mr. E. R. Buckell at Chilcotin, B.C., on May 20th, 1920. This pretty little species, with its sprinkling of iridescent scales, is a new record for the Province. Four specimens were taken, but they were not in the most perfect condition, the one figured being the best. It has also been taken at Vernon (Ruhmann).

Our sincere thanks are due to the following specialists for identifying material during the past season: Dr. J. M. Aldrich, Dr. W. Barnes, Foster H. Benjamin, August Busck, R. A. Cushman, Dr. H. G. Dyar, Carl Heinrich, Dr. A. W. Lindsey, Dr. J. McDunnough, S. A. Rohwer, and L. W. Swett.

THE PTEROPHORIDÆ OF BRITISH COLUMBIA.

By E. H. Blackmore, F.E.S.

The recent publication of "The Pterophoridæ of America, North of Mexico," by Drs. Barnes and Lindsey (Cont. Lep. No. Amer., Vol. IV., No. 4, Aug. 1921) has so altered our conception of many of the species, and also of some of the genera in this family, that I have thought it advisable to write this short paper on the species occurring in British Columbia, and to bring them up to date as regards correct determination and nomenclature.

In the Check-list of British Columbia Lepidoptera published in 1906 there are naturally a number of misidentifications, many species to be eliminated, and there are also a considerable number of additions.

The species of this family are for the greater part very difficult to determine correctly, and I wish to express my sincere thanks to Dr. A. W. Lindsey for his willing and kindly help in determining a large number of specimens of doubtful and little-known species. I am also grateful for his kind permission to make use of any part of the "Revision" that is applicable to our British Columbia species.

My thanks are also due to Messrs. Bryant, Cockle, Day, Hanham, and Ruhmann for the loan of material, without which this paper would have been incomplete.

The Pterophoridæ can be distinguished primarily from any other family by the presence of a series of black spine-like scales on the under-surface of the secondaries.

In all the North American species, with one exception, the primaries are bifid and the secondaries are trifid. The exception noted is *Agdistis americana* B. & L., which has both fore and hind wings entire. Two other exotic genera have the same characteristic, while another one has the primaries quadrifid and a third has them trifid.

The following general remarks on the family as a whole, taken from Genera Insectorum Fasc., 100 (Pterophoridæ by E. Meyrick), will prove of interest:—

"Ovum more or less oval, smooth. Larva rather short, with more or less developed fascicles of hairs; usually feeding exposed on flowers or leaves, but sometimes internally in stems or seed-vessels. Pupa sometimes hairy, attached by tail, or in a slight cocoon above ground. The majority of those species whose food-plants are known are attached to the Compositæ, which are the most highly organized group of dicotyledonous plants, and this is especially true of the two largest genera, *Platyptilia* and *Pterophorus* (*Oidæmatophorus*), where the association with this order is very marked, probably nine-tenths of the species being attached to it.

"The fore wings of the imago are very elongate, narrow, dilated posteriorly, and the legs are very long and unusually slender. The general structure seems adapted to secure extreme lightness, thus enabling distribution to be effected by the wind without much effort on the part of the insect; hence the species need and possess very little muscular power, and are quite unable to fly against even a moderate breeze. The method of distribution has been effective, for the species have spread over the whole globe, including the principal oceanic islands; though the wide distribution of some cosmopolitan species is due to artificial introduction with the cultivated shrubs and trees on which the larvæ feed.

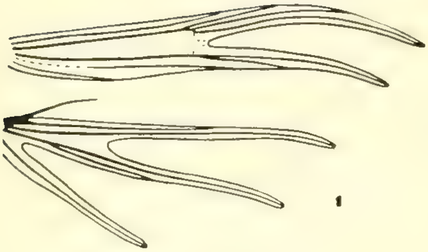
"Probably all the principal genera originated in Asia, which shows much the greatest diversity of generic forms; the great specific development of *Platyptilia* and *Pterophorus* (*Oidæmatophorus*) in America would seem to be due to the large variety of abundant suitable food-plants (Compositæ) offered, whilst the relatively insignificant generic modification indicates that the family did not find its way to America until long after its first origin. I infer, therefore, that it originated not only late in time, but at a period when Asia was comparatively isolated from other regions by wide seas, and that on eventually gaining access to the other continents it found them already well-stocked with a large lepidopterous fauna."

In North America eleven genera are listed, embracing some 116 species, of which British Columbia is represented by six genera with a total of 30 species, being slightly over 25 per cent. of the whole. The synonyms of genera and species are not given in their entirety, but only so far as they represent names previously given in former B.C. Check-lists. The descriptions of genera are given with the venation omitted, but sufficient structural characters are given that with the additional aid of the plate, no difficulty should be experienced in placing any specimen in its proper genus. The descriptions of species are not given in full detail, but all the essential characters necessary for the identification of our British Columbia species are included.

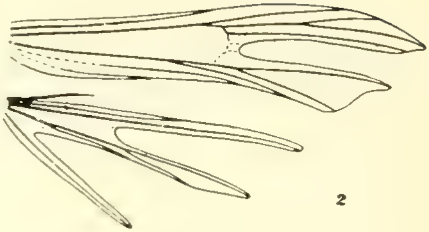
PLATE V.

PTEROPHORIDÆ.

WING OUTLINES OF BRITISH COLUMBIA GENERA.



1. TRICHOPTILUS.



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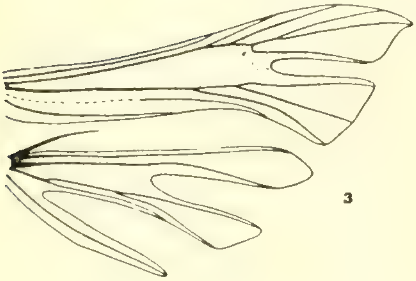
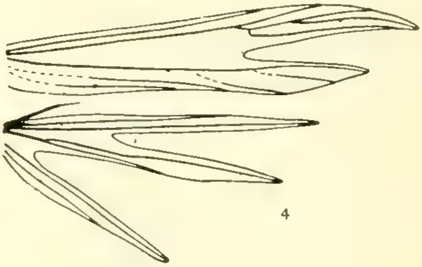
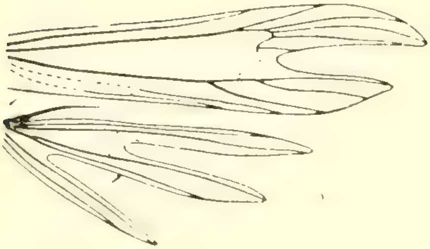


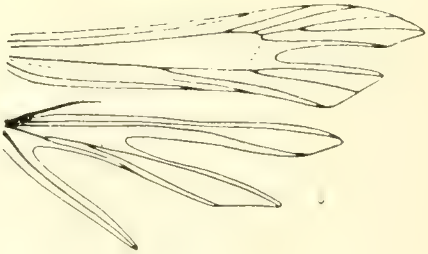
3. PLATYPTILIA.



4. STENOPTILIA.



5. ADAINA.



6. OIDÆMATOPHORUS.

NOTE.—The above figures were photographed from the original plate in Messrs. Barnes and Lindsey's "Pterophoridæ of America, North of Mexico," by the kind permission of Dr. A. W. Lindsey.

FAMILY PTEROPHORIDAE.

Genus TRICHOPTILUS Walsingham.

Trichoptilus Walsingham, Pteroph. Cal., Ore., 62, 1880. Characters: Forehead without tuft; ocelli obsolete. Labial palpi moderate, ascending. Fore wings cleft from before middle, both lobes slender, tapering, without anal angle.

1. Trichoptilus pygmæus Walsingham, Pter. Cal., Ore., 64, 1880. A very small species measuring about 10 mm. in expanse. Fore wings very pale fawn, barred with white on both lobes.

Two specimens taken at Wellington, B.C. (Bryant), on 30-VI.-03 and 11-VII.-03 respectively. One specimen is without head or body and the other is simply pinned. There is no record of any other specimens having been taken since. An exceedingly rare species. The type series included three specimens taken near Millville, Cal., on July 11th, 1871. Two of them are in the British Museum, the remaining one being in the Fernald collection at Amherst, Mass. One other specimen is in the U.S. National Museum. I believe that these six specimens are all that are known.

Genus PTEROPHORUS Geoffroy.

Pterophorus Geoffroy, Hist. Nat. Ins., II., page 90, 1762.

Oxyptilus Zeller, Isis X., page 765, 1841.

Characters: Forehead smooth without tuft; ocelli obsolete. Labial palpi moderate, oblique; second joint with a ventral apical tuft in one British Columbian species; third joint moderate. Tibiæ thickened with scales at base of spurs. Primaries bifid, cleft from about middle. Secondaries trifid, third feather with a well-developed tuft of black scales in the fringes of the inner margin.

1. Pterophorus tenuidactylus Fitch. Trans. N.Y. Agr. Soc., XIV., 848, 1854. Primaries dark brown with a coppery tinge, with a fine transverse white line across outer half of both lobes. First lobe with a broader stripe basad of this; second lobe with this stripe reduced to a small white patch. Palpi white with lateral brown stripes. Thorax white behind. Abdomen brown with diverging pairs of white stripes on the third segment. Fourth segment entirely brown above; fifth mostly white. Beneath the abdomen is more heavily marked with white. Expanse, 13–17 mm.

Dyar in his "Kootenai List" records two specimens of this species as having been bred from the thimble-berry (*Rubus nutkanus*). Specimens sent to me by Mr. J. W. Cockle from Kaslo as *tenuidactylus* turn out to be *Pterophorus delawaricus* Zell. The only authentic specimen that I have seen is a unique taken by Mr. G. O. Day at Quamichan Lake, near Duncan, on July 14th, 1907. Dr. Lindsey tells me that the species is widely distributed and is quite common in some localities.

2. Pterophorus ningoris Walsingham, Pter. Cal., Ore., 26, 1880. Fore wings dull brown with a greyish cast caused by the presence of white and fuscous scales. Both lobes crossed by two white lines; the outer one slender, the inner one broad. The lobes are somewhat narrower than in our other two species of this genus. Secondaries brown; third lobe paler, white beyond middle, with large tuft of blackish scales in fringes at outer third. Palpi rather long and slender, oblique, dark brown, with both joints white-tipped. First spurs attached about three-fifths from base of tibia and reaching its tip. Expanse, 18–20 mm.

Dyar records it from Kaslo and states that the larvæ were found feeding on a herbaceous plant with milky juice, *Hieracium albiflorum*. In our 1906 B.C. Check-list it is also recorded from Wellington, but the specimens labelled *ningoris* in the Bryant collection and from which the record was taken all prove upon examination to be *delawaricus*. Mr. Day took one female specimen at Cowichan Lake on June 18th, 1913.

3. Pterophorus delawaricus Zeller, Verh z-b Ges. Wien., XXIII., 320, 1873. Fore wings bright golden-brown, with both lobes crossed by two inwardly oblique white stripes; the outer one slender, the inner one broader. Palpi brown at the sides; the vestiture of the second joint produced into a point below, which almost reaches tip of third. Abdomen with diverging white dashes above. Expanse, 18–20 mm.

This species is far more common than the other two. I have it from Victoria (Blackmore); Fitzgerald (Carter); Goldstream (Blackmore); Wellington (Bryant); Fraser Mills (Marmont); Kaslo (Cockle); and Rossland (Danby); the dates ranging from June 16th to July 26th.

The three species are superficially very close, but *delawaricus* can be separated from *tenuidactylus* and *ningoris* by the second joint of the labial palpi having a projecting ventral tuft which nearly reaches the tip of the third, and *tenuidactylus* can be distinguished from *ningoris* by the position of the median spurs on the hind tibiæ. In *tenuidactylus* these spurs are attached to about the middle of the tibiæ, while in *ningoris* they are attached three-fifths or more of length of joint from its base.

Genus PLATYPTILIA Huebner.

Platyptilia Hüebner, Verz. bek. Schmett., 429, 1826. Characters: Front with a prominent scale tuft in some species, usually with at least a moderate tuft. Palpi short, scarcely exceeding front, to long; second joint oblique; third porrect. Tibiæ sometimes with slight scale-tufts. Fore wings cleft not more than one-third their length, anal angle evident on both lobes, in some species prominent and in some retreating. Hind wings trifid, third feather with black scales or scale-tuft in fringes of inner margin in most species.

1. Platyptilia punctidactyla Haworth, Lep. Brit., 479, 1812.

Alucita cosmodactyla Hüebner, Samml. Eur. Schmett., 35, 1823.

Primaries brownish-grey to olive-black, with a very variable superficial white irroration. Costa with white dots on a blackish ground running from base of wing to cleft. A black triangle, paler on the costa, reaches just beyond base of cleft. Third feather of secondaries with black scales along inner margin, a large triangular scale-tooth just beyond middle and a small tuft at apex. Expanse, 20–23 mm.

This is the *cosmodactyla* of our previous lists, which Meyrick places as a synonym of *punctidactyla*. Although only previously recorded from Kaslo, it is widely distributed, as I have it from Victoria (Blackmore); Fitzgerald (Carter); Goldstream (Blackmore); Duncan (Day); Wellington (Bryant); Fraser Mills (Marmont); Lillooet (Phair); Mount McLean (Hanham); Fort Fraser (Anderson); Kaslo (Cockle); and Chilcotin (Buckell). The species extends as far east as Manitoba, south to Illinois, Colorado, and South California. It also occurs in Europe and Japan. It feeds on a number of food-plants; Meyrick (Handb. Brit. Lep., 433, 1895) gives *Stachys, Aquilegia* and *Geranium* as the European food-plants. Dyar records it from Kaslo as feeding in the red bracts of the high-bush honeysuckle (*Lonicera involucrata*). Mr. Cockle bred specimens from the Indian paint-brush (*Castilleja*) in 1907.

2. Platyptilia pica Walsingham, Pter. Cal., Ore., 21, 1880. Primaries white to well beyond base of cleft, followed by a black shade which terminates at the usual transverse white lines on the two lobes. Costa black with white spots and a heavy black triangle before cleft. Terminal area brownish with white scales which sometimes cover the darker colour. Third lobe of secondaries much as in the preceding species. The abdomen offers the only constant distinguishing feature. Its upper surface is marked with a large white triangle on each segment, apex forward, and the last few segments are almost entirely white. Beneath it is broadly white in its distal half. Expanse, 18–24 mm.

This species is rather uncommon, the specific localities being Victoria (Carter); Fitzgerald (Blackmore); Duncan (Day); and Wellington (Bryant). It has not been recorded from the Mainland as yet. The types were taken at Crescent City, North California, and it has been taken at Seattle and Mount Rainier, Wash.

The species varies considerably and in some cases closely approaches *punctidactyla*. The two species, however, can always be separated by the white triangles on the abdomen as noted above.

3. Platyptilia tesseradactyla Linnæus, Faun. Suec., 370, 1761. Primaries rather evenly greyish, the markings produced by variation in the mixture of white scales, and therefore powdery and indefinite. Costa darker, dotted with white, with the usual dark triangle before cleft, sometimes very vague. Outer transverse white line present, incomplete on second lobe. Secondaries with dark scales at tip of each lobe and a weak tuft of approximately equal dark scales just beyond middle of inner margin of third lobe. Palpi small, scarcely exceeding front. Thorax white behind. Expanse, 16–20 mm.

This is apparently a rare species in the Province. In Dyars "Kootenai List" he records two specimens—Bear Lake Mountain (July 29th) and Kokanee Mountain (August 11th). None have been recorded since until this year. Mr. R. S. Thomson, who was with a surveying party in the mountains some 10 miles from Princeton, captured a single pterophorid which was determined by Dr. Lindsey as this species. In Mr. M. Ruhmann's material there is a single specimen labelled Vernon, but without date. The species occurs in Eastern Canada and the Atlantic States, extending west to Pennsylvania and Colorado. It also occurs in Europe and West Central Central Asia.

4. Platyptilia carduidactyla Riley, Rept. Ins. Mo., 180, 1869. Primaries brownish-buff, with the costa dark brown dotted with white as far as the usual brown triangle, which is much the darkest part of the wing. The heavy triangle contains a dark transverse dash before cleft which is visible only in pale specimens; both lobes pale brown crossed by a vague light line toward outer margin. Fringes grey-buff with a row of brown scales in base along outer margin, grey tufts at apices and anal angles, and two dark-brown scale-tufts on inner margin. Secondaries grey-brown, fringes slightly paler, with short dark scales at apices of first two lobes. Fringes of inner margin of third lobe with a prominent triangular tooth of dark-brown scales at middle. This tooth is preceded and followed by a variably complete row of short, dark scales and the lobe is whitish before it. Frontal tuft moderate, blunt, surpassed by third joint of oblique palpi. Expanse, 20–27 mm.

This is one of our commonest species and is widely distributed. I have specimens from a large number of localities; from Vancouver Island to Rossland and from Prince Rupert to Vavenby. It occurs all throughout the United States and has been taken at Labrador. According to Riley, the larvæ are gregarious, living in webbed heads of common thistles.

5. Platyptilia percnodactyla Walsingham, Pter. Cal., Ore., 8, 1880. The general appearance of this species is substantially the same as the preceding, differing chiefly in the greatly reduced scale-tuft on the third lobe of secondaries.

In *carduidactyla* this scale-tooth is distinctly triangular; in *percnodactyla* it is often very weak and made up of scales of approximately equal length. They may be forms of one species, but the early stages of *percnodactyla* are unknown. Careful breeding may clear up the standing of the species. Specimens which have been definitely determined as this species are from Victoria (Carter); Goldstream (Blackmore); Wellington (Bryant); and Mount McLean (Day and Hanham).

6. Platyptilia edwardsii Fish. Can. Ent., XIII., 72, 1881. Primaries buff, frequently tinged with brown and hoary with whitish scales, the buff appearing only in the pale markings and along the inner margin. The usual dark triangle is blackish-brown. Brown shade continued along costa to base, towards which it becomes faint. Brown spot in cell is usually connected with costa. Inner margin frequently with brown shades. Both lobes with pale outer line, incomplete on second, preceded by a heavy brown shade which blends into buff or greyish towards triangle. Terminal area hoary with whitish scales over brown. Secondaries grey-brown, third lobe having scattered brown scales on inner margin and a variable but always weak tuft of slender, almost equal brown scales within outer third of feather. Thorax somewhat hoary, whitish behind. Palpi moderate, oblique, scarcely exceeding the short, conical frontal tuft. Expanse, 19–29 mm.

This is apparently a high-altitude species in British Columbia and has only been taken in a few localities—Hope Mountains (Day); Mount McLean (Hanham and Day); Kaslo (Cockle); Rossland (Danby); and Mount Cheam (Harvey). The types were taken at Boston and Amherst, Mass., and it also occurs on Mount Rainier, Wash.

Edwardsii can always be separated from the two preceding species by the scale-tooth on the inner margin of the third feather of secondaries being always placed at the outer third, while in *carduidactyla* and *percnodactyla* it is in the middle of the lobe. In addition, the species is considerably darker in appearance and generally larger, although all three species vary considerably in size.

7. Platyptilia orthocarpi Walsingham, Pter. Cal., Ore., 11., 1880. Primaries ochreous along inner margin, mixed brown and white with a few ochreous scales toward costa. Costa itself narrowly blackish-brown with white dots. Dark triangle before cleft. Terminal area brown, hoary with white scales, preceded by a faint transverse pale line, less complete on second lobe. Spaces between this and triangle ochreous irrorate with white, with an elongate triangular brown dash and costal shade on first lobe and two dashes on second. Cleft margined with a few dark scales. Secondaries brown, third lobe more ochreous. Fringes greyish with white bases along inner margins and at apices of first two lobes; containing a few brown scales in basal half of third lobe. Palpi brownish ochreous, moderate, oblique, touched with white above

and below. Thorax mostly whitish in front and behind, brownish ochreous across tips of patagia. Expanse, 20–26 mm.

A very rare species. There is only one record from British Columbia—a single specimen taken by Mr. G. O. Day in June. The type came from Northern Oregon, where they were reared from a species of *Orthocarpus*. Writing of *orthocarpi*, Barnes and Lindsey state that "Together with *fragilis*, *shastæ*, and *albida*, they make up an extremely difficult group which we are inclined to believe in a state of evolution. The named forms can be recognized, but whether to regard them as forms and races of one species or as distinct species is a question which we are unable to decide."

8. PLATYPTILIA FRAGILIS Walsingham, Pter. Cal., Ore., 16, 1880. In this species the characters are much the same as in the preceding, except that the general colour is more or less buff or light brown. Expanse, 20–24 mm.

In the Bryant collection several specimens stood under the name of *fragilis*, but upon examination they all proved to be *albiciliata* Wals., with the exception of one specimen, which Dr. Lindsey agrees is *fragilis*. The specimen is a little undersized, barely measuring 18 mm. It lacks antennæ and abdomen, but is otherwise in good condition. It was taken by Mr. Bryant at Wellington on July 13th, 1903. The species occurs in Washington, California, Arizona, and Colorado.

9. PLATYPTILIA ALBICILIATA Walsingham, Pter. Cal., Ore., 17, 1880. Fore wings even dull brown, dark triangle faintly indicated. Fringes greyish with pale bases which bear a row of dark scales on the outer margin. Secondaries are concolorous, their fringes with pale bases, sometimes conspicuous, and a few scattered brown scales along the inner margin of the third lobe. Expanse, 21 mm. Thorax somewhat lighter behind. Palpi are moderate, oblique, and the frontal tuft very short and blunt.

British Columbia examples differ from the above abbreviated description, in having the dark triangle well marked and the outer pale line discernible on the first lobe in most specimens. There is also some irroration of bluish-white scales on the disk and along the costal edge; in some specimens this irroration is extended to the terminal area of both lobes of the primaries. The species has been taken at Wellington (Bryant); Mount McLean (Day); and at Barkerville (Buckell). The single specimen taken by Mr. Buckell is a darker brown than the other British Columbia specimens and of a more even colour. The species was described from North California. There is a specimen from Montana in the Barnes collection which is doubtfully referred to this species. The early stages are unknown.

10. PLATYPTILIA ALBICANS Fish, Can. Ent., XIII., 71, 1881. Primaries creamy white with white-irrorate brown areas, the colours about equally extensive. Both lobes with a terminal brown band and one just before middle which fades out toward inner margin. Costa brown as far as base of cleft and inward to a transverse dash before cleft. Fringes white with grey tips; brown and white scales in bases along outer margin. Secondaries grey-brown with a faint tuft of slender scales, not visible without lens, near middle of inner margin of third lobe. Expanse 17–24 mm. Frontal tuft lacking. Palpi small and slender, but projecting well beyond front; brownish on sides.

The only records for British Columbia are specimens taken by Mr. G. O. Day. One taken at Hope Mountains in July, 1908, and another one taken on Stokers Mountain, near Cowichan Lake, on July 23rd, 1909. Writing on the species, Barnes and Lindsey remark "that the Stoker Mountain specimen is anomalous. We place it here with little hesitation, though it is so much darker than the typical form that a casual examination discloses little resemblance. It corresponds in essential features with our series, but differs in having the brown areas darker and more extended, the pale areas consequently narrow and somewhat tinged with brown."

The species was described from Nevada and has been taken at Wyoming and Colorado. The early stages are unknown.

11. PLATYPTILIA PALLIDACTYLA Haworth, Lep. Brit., 478, 1812. Primaries with nebulous bright-brown and whitish markings. Cleft preceded by two brown dots. Pale areas a blotch in cell, preceded by a brown dot, one near inner margin about one-third from base, and a broader area below base of cleft. Lobes paler brown, crossed by a pale line outwardly and with a pale area on costa above base of cleft, before which costa is narrowly dark brown, dotted with white. All brown areas slightly irrorate with white. Secondaries brown. Fringes of inner margin of third lobe with pale bases and usually with a faint cluster of slender dark scales just beyond

middle. Expanse 21–26 mm. Frontal tuft about as long as head, sharply pointed. Palpi long, slender, porrect, noticeably surpassing tuft.

Our British Columbia specimens agree with the above description, excepting in the faint cluster of slender dark scales on the inner margin of third lobe. In all the specimens I have examined the cluster is absent, but in most of the specimens there are a few scattered dark scales, mostly in the basal half. I have it from Victoria (Carter); Goldstream (Day and Blackmore); Vernon (Ruhmann); and Kaslo (Cockle). I found it not uncommon at Goldstream in June. It apparently ranges over the entire North American Continent north of 37° latitude, and also occurs in Europe.

12. Platyptilia albertæ Barnes and Lindsey, Cont. Lep. No. Amer., Vol. IV., No. 4, 346, Aug., 1921. Primaries white. Costa narrowly brownish-grey to cleft. Cleft preceded by two dark dots; a third similar dot in middle of cell. Lobes with terminal and median greyish shades defining the broad outer white line. Fringes white, basal scales on outer margin white. Secondaries very light brownish-grey, fringes and third lobe paler. Expanse 24–27 mm.

The shape of the primaries is distinctive. Towards the apex the costa is abruptly rounded, the apex is very blunt, and the outer margin of the first lobe almost straight. The first lobe and consequently the entire wing looks very wide and blunt. Frontal tuft as long as head, sharply pointed. Palpi moderate, oblique surpassing front, but not reaching end of tuft.

The species was described from four specimens, as follows: Holotype female, Laggan, Alta., August 16th to 23rd, and one paratype female, Olympic Mountains, Wash., in Coll. Barnes. Allotype male, Mount Cheam, B.C., August, in Coll. Blackmore. Paratype female, Laggan, Alta., August 16th to 23rd, in U.S. National Museum.

The Mount Cheam specimen was taken by the late Captain R. V. Harvey in August, 1903. Among some material sent by Mr. Cockle, of Kaslo, for examination were two specimens of this new species. Both of them are rather worn and one is without abdomen; the latter, presumably taken at Kaslo, is without date. The other specimen was taken at Sandon on August 9th, 1904.

Unfortunately the wings have a tendency to stain easily and in the allotype they are more or less tawny. It is evidently a high-altitude species.

Genus STENOPTILIA Huebner.

Stenoptilia Hüebner, Verz. bek. Schmett., 430, 1826. Front with a rounded or conical prominence or a scale-tuft. Ocelli present. Palpi various. Primaries bifid, cleft from about two-thirds. Secondaries trifid, third feather without dark scales in fringes of inner margin. Anal angles of both lobes of primaries very retreating. Very closely allied to the preceding genus, but can be separated from the greater part of *Platyptilia* by the lack of dark scales in the fringes of the secondaries and from the remainder by the retreating anal angles.

1. Stenoptilia mengeli Fernald, Pter. No. Amer., 60, 1898. Primaries ashy-grey and glistening; a few dark fuscous scales on the first lobe form an ill-defined longitudinal stripe on the middle; a fuscous spot at the end of the cleft. Hind wings ashy-grey. Expanse 20 mm. Thorax and palpi dark ashy-grey. A fine white line occurs over each eye.

A single specimen taken by Mr. A. W. Hanham on Mount McLean in August constitutes our only record. It is a rather surprising capture, as very few specimens are known. It was described from ten poor specimens taken by Mr. W. L. Mengel at McCormack's Bay, North Greenland in 1891. Barnes and Lindsey record a single specimen from Colorado which is slightly paler than the types. The latter specimen is in the U.S. National Museum. This is apparently all that are known.

2. Stenoptilia exclamationis Walsingham, Pter. Cal., Ore., 32, 1880.

Stenoptilia coloradensis Fernald, Pter. No. Amer., 61, 1898.

Primaries dark brownish-grey on costa, blending into ochreous or pale grey on inner margin, and irrorate with white in most specimens. The white scales are heaviest on the terminal area of both lobes. Cleft preceded by two blackish dots, usually fused. First lobe with a heavy blackish shade, margined outwardly with white and preceded on costa by a white dash. There is usually a blackish dot near middle of cell. Fringes white in cleft, with greyish clusters before outer margin, elsewhere grey, white below apices of both lobes. Secondaries brownish-grey with concolotus fringes. Expanses, 18–24 mm. (British Columbia examples are more consistent in size, measuring 22 mm.) Palpi moderate, whitish above; third joint small; a white line over each eye.

A rather uncommon species in the Province. I have it from Fitzgerald (Carter) and Fraser Mills (Marmont), and have seen a specimen from Kaslo (Cockle). The species occurs in Manitoba and Ontario. The types of *exclamationis* came from the Siskiyou Mountains, North California, and the types of *coloradensis* were taken in Colorado. Barnes and Lindsey, who have examined the types, consider them conspecific. The early stages are unknown.

Genus ADAINA Tutt.

Adaina Tutt, Ent. Rec., XVII., 37, 1905. Ocelli obsolete. Palpi moderate, ascending, slender. Primaries cleft from two-thirds or before. Secondaries trifid, third feather without black scales in fringes. Very close to *Oidæmatophorus*, but differs chiefly in venation of primaries, as a reference to the figures on Plate V. will show. The cleft in primaries is also cut more deeply, thus making the lobes longer in proportion.

1. ADAINA MONTANA Wals. form DECLIVIS Meyrick, Exot. Microlep., I., 112, 1913. Primaries cleft to three-fifths, lobes rather narrow, equal, pointed; white, sometimes mixed with light-brownish suffusion; basal half with a few scattered dark fuscous scales; a moderate oblique fascia of dark fuscous irroration from costa beyond base of cleft to middle of inner margin. Both lobes more or less sprinkled with dark fuscous. Fringes white on inner margins of both lobes, brownish towards apices. Secondaries rather dark grey with fringes paler. Expanse 16 mm. Thorax white, posterior half sometimes light brownish, abdomen white, sometimes with faint brownish dorsal lines. (The British Columbia example has the posterior half of the thorax and the abdomen a light ochreous.)

One specimen in fair condition taken by Mr. W. B. Anderson at Fort Fraser on September 16th, 1921.

The species was described from two specimens taken at Toronto, Ont., in August. It also occurs in Manitoba. It has been reared in Colorado by Dyar and Caudell in the heads of *Helianthus pumilus*.

Genus OIDAEMATOPHORUS Wallengren.

Oidæmatophorus Wallengren, Skand. F-jiid., 19, 1859.

Pterophorus Wallengren (not Geoff.), *ibidem*, 20, 1859.

Front rarely with tuft. Ocelli obsolete. Palpi short to long, usually slender, and more or less oblique. Tibia with or without conspicuous scale-tufts. Primaries cleft two-fifths or less. Secondaries trifid, fringes without black scales.

Writing of this genus, Barnes and Lindsey state, in part, that "The species of *Oidæmatophorus* are not at all difficult to identify when one has gained some familiarity with them. Usually some one or two characters suffice, but we have found that very nearly all characters of colour and pattern are subject to such variation that the construction of a key is very difficult."

As there are sixty species of this genus in North America, many of which are closely allied, the authors prepared a key combining structural characters together with those of coloration and maculation. A number of species were inserted under two categories so as to make use of the most salient features.

As only eleven of these species occur in the Province, I have constructed a key based (with the exception of *monodactylus* Linn.) on the colour and pattern of the wings alone, which I think will suffice for the identification of most of our British Columbia species of this genus.

Key to the Species.

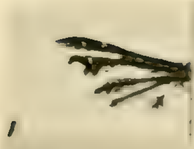
1. Primaries white or whitish 2
   Primaries light ochreous to tawny 4
2. Primaries white with scattered dark-brown irroration; a dark-brown costal patch over base of cleft ....2 *mathewianus*
   Primaries whitish 3
3. With a wide dark-brown diskal streak from base to cleft; oblique costal patch over base of cleft ....5 *fieldi*
   With wide tawny streak on costal margin of first lobe; fringes on primaries brown, contrastingly darker than wing. No costal patch ....6 *phœbus*
4. Primaries tawny with heavy brown costal mark over base of cleft; small brown shade before cleft ....1 *occidentalis*
   Primaries light ochreous; a blackish-brown rounded spot a short distance before cleft and another fainter one above it, sometimes connected by a faint line ....7 *helianthi*

PLATE VI.

PTEROPHORIDÆ

1. *Pterophorus tenuidactylus* Fitch. Quamichan Lake, B.C
2 *Pterophorus delawaricus* Zell. Fraser Mills, B.C
3 *Stenoptilia exclamationis* Wlsm. Fraser Mills, B.C.
4 *Platyptilia punctidactyla* Haw. Kaslo, B.C.
5 *Platyptilia pica* Wslm. Victoria, B.C.
6 *Platyptilia tesseradactyla* Linn. Vernon, B.C.
7 *Platyptilia fragilis* Wlsm. Wellington, B.C.
8 *Platyptilia albiciliata* Wlsm. Wellington, B.C.
9 *Platyptilia carduidactyla* Riley. Victoria, B.C.
10 *Platyptilia pallidactyla* Haw. Goldstream, B.C.
11 *Platyptilia edwardsii* Fish. Mount McLean, B.C.
12 *Oidæmatophorus fieldi* Wright. Atlin, B.C.
13 *Oidæmatophorus grisescens* Wlsm. Kaslo, B.C.
14 *Oidæmatophorus cineraceus* Fish. Alberni, B.C.
15 *Adaina montana declivis* Meyr. Fort Fraser, B.C.
16. *Stenoptilia mengeli* Fern. Mount McLean, B.C.
17. *Oidæmatophorus corvus* B. & L. Goldstream, B.C
18 *Oidæmatophorus stramineus* Wlsm. Kaslo, B.C.
19 *Oidæmatophorus occidentalis* Wlsm. Vavenby, B.C.
20 *Oidæmatophorus mathewianus* Zell. Kaslo, B.C.
21 *Oidæmatophorus helianthi* Wlsm. Kaslo, B.C.
22 *Oidæmatophorus homodactylus* Wlk. Mount McLean, B.C.
23 *Oidæmatophorus monodactylus* Linn. Victoria, B.C.
24 *Platyptilia alberta* B. & L. Kaslo, B.C.

PLATE VI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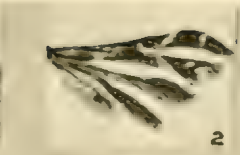
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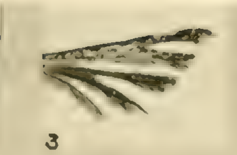
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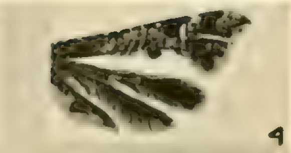
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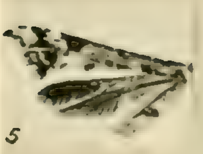
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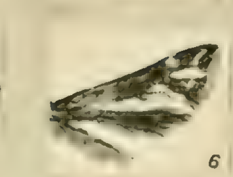
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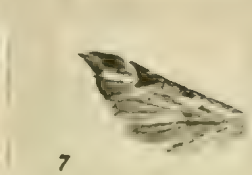
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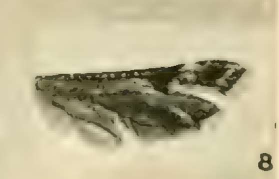
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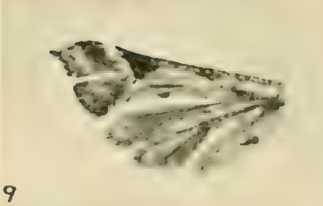
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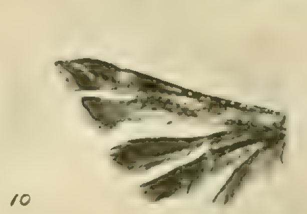
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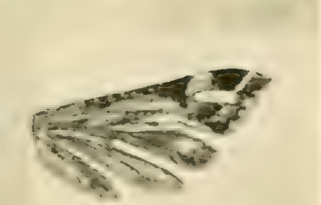
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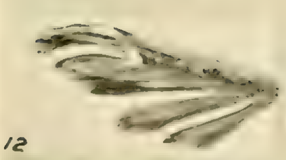
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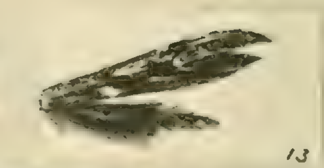
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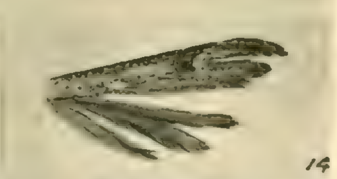
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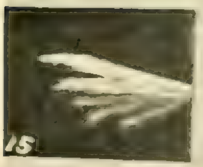
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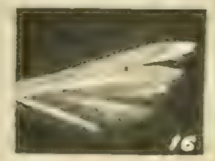
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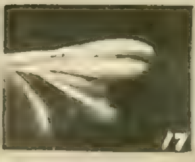
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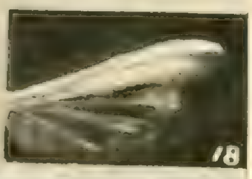
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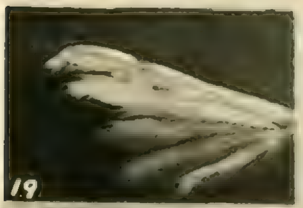
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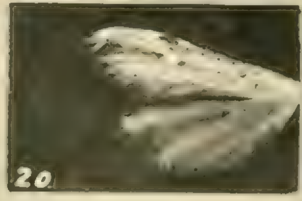
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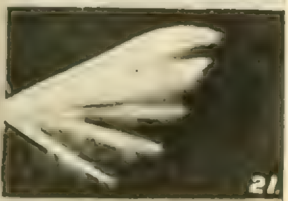
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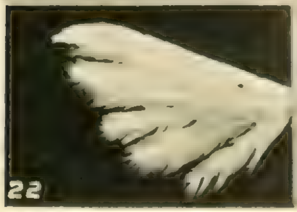
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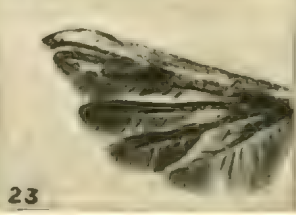
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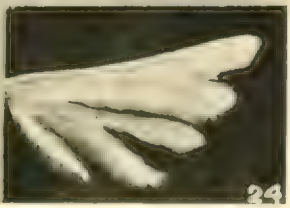
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5. Species smaller. Primaries pale yellow or yellow-tinged 6
Not such species 7
6. Primaries definitely yellowish; generally with a heavy tawny shade from base to first lobe. Expanse, 15–21 mm. ....9 *stramineus*
Primaries pale greyish-yellow; a greyish-brown shade generally present in first lobe. Secondaries conspicuously darker. Expanse 17–20 mm. ....10 *[illegible]*
7. Entirely snowy white ....8 *homodactylus*
Primaries grey, powdered with blackish-brown and white scales; inner margin conspicuously brownish ....3 *grisescens*
Primaries ash-brown to ash-grey, generally heavily irrorated with blackish scales. Base of cleft white preceded by a blackish triangular mark connecting with a dark costal dash ....4 *cineraceus*
Primaries variable; from tawny to red-brown and grey; anal angle of second lobe with extremely long fringes. Hind tarsi with a conspicuous dorsal crest on upper surface .... 11 *monodactylus*

1. Oidæmatophorus occidentalis Walsingham, Pter. Cal., Ore., 37, 1880. Primaries creamy white to deep ochreous, normally with a heavy brown costal mark over base of cleft, preceded and followed by a few whitish scales. This patch is connected with a small brown triangular shade before cleft. The wing is marked with cloudy brown areas and the first lobe is light brown. Fringes even tawny-grey. Secondaries brownish, shining with paler fringes. Expanse 26–29 mm. Head with a pale patch between antennæ, otherwise the darkest part. Thorax concolorous with primaries, paler behind. Palpi rather small, oblique; second joint thickened, white-tipped. Front tibiæ with a heavy double tuft of brown scales in terminal half, mid-tibiæ with heavy median and terminal tufts of the same colour. Inner spur of median pair on hind tibiæ almost twice as long as outer. A very variable species.

The records in British Columbia are from Kaslo (Cockle); Rossland (Danby); Vavenby (Moilliet); and a rather worn specimen from Fort Steele (W. B. Anderson). The type series was taken in California and it occurs in Arizona and Utah.

2. Oidæmatophorus mathewianus Zeller. Verh. Zoot.-bot. Ges. Wien., 445, 1874. Primaries white with variably extensive tawny brown shades, usually confined to inner half, but sometimes encroaching on first lobe. Costa with scattered dark-brown scales forming a long spot over base of cleft and two white dots beyond. Cleft preceded by a white area, and this by a dark-brown dash continued obliquely to costal spot by a light-brown shade. Sometimes a dark dot near middle of cell and some scattered patches of dark-brown irroration. Inner margin of first lobe with a brown dot before apex, followed by a white pencil in the fringe. Fringes light brownish-grey with some white hairs. Secondaries brownish-grey. Expanse 21–27 mm. Head, thorax, and abdomen white. Palpi short, oblique, brown-speckled. Front tibiæ with a large brown scale tuft; mid-tibiæ with two heavy brown tufts; hind legs white.

Described from Vancouver Island. I have not seen any specimens from the Island, although extensive collecting has been done on the southern portion of the Island, neither are there any specimens in the Bryant collection from Wellington. A short series was taken in August by Messrs. Day and Hanham on Mount McLean, and three specimens sent to me by Mr. Cockle, of Kaslo, as *Petrophorus brucei* Fern. turn out to be this species. Mr. Day records a specimen of this species taken by his son at Dawson, Yukon Territory, in 1910. It occurs in Southern California, and Barnes and Lindsey refer to this species specimens taken in Colorado and Maine which differ from typical specimens, but agree in all essential features.

3. Oidæmatophorus grisescens Walsingham, Pter. Cal., Ore., 34, 1880. Primaries narrow, heavily sprinkled with white, and with some scattered blackish scales. Ground colour of inner half, brown; of costal half, apparently grey-brown, the scales tipped with white; but this area of the wing is greyish-white because of the predominating white scales. Costa with a grey-brown dash over base of cleft and two spots beyond. Cleft preceded by a white patch, and this by a small blackish spot curving forward to costal dash in a slender line. First lobe with a black dot before apex, followed by a white pencil in the fringes. Fringes brownish-grey with a mixture of white hairs. Secondaries grey-brown with concolorous fringes. Expanse 23–30 mm. Head and thorax clothed with grey-tipped white scales. Palpi short, oblique, each joint white-tipped. Abdomen whitish with brown-tipped scale tufts on posterior margins of segments.

One specimen taken by Mr. Cockle at Kaslo on August 1st, 1907. This is a very distinct species and cannot be confused with any other British Columbia species. Type series were reared from *Artemisia* sp., at Rogue River, Southern Oregon. It also occurs in California, Colorado, and Arizona. Barnes and Lindsey also record a specimen from "British Columbia (June)," but no specific locality is given.

4. OIDÆMATOPHORUS CINERACEUS Fish., Can., Ent., XIII., 73, 1881. Primaries brownish-white to greyish, often darker toward costa. There is a variable irroration of blackish scales which tends to collect between the veins and in the basal half of the wing. Whitish at base of cleft, preceded by a brown dash which curves outward to brown costal dash above base of cleft. Fringes brownish-grey with a few white hairs. Secondaries grey-brown with fringes, concolorous. Expanse 27–29 mm. Palpi short, oblique. Abdomen brownish-white, with central dark dots in distal half.

Not uncommon and widely distributed. Recorded from Duncan (Day); Wellington (Bryant); Alberni (Redford); Mount McLean (Day); Kaslo (Cockle); and Vavenby (Moilliet). We have not seen the species from either Victoria or Goldstream.

Our British Columbia specimens are very even in their colouring, all that I have seen being of the typical brownish-white form. The irroration of the blackish scales is, however, very variable. The species occurs in Washington, California, Colorado, Utah, Pennsylvania, and Manitoba. The life-history is unknown.

5. OIDÆMATOPHORUS FIELDI Wright, Ent. News. XXXII., 6, 1921. Primaries: Ground colour white; the costal edge, discal area from base to cleft, and inner margin broadly brown-streaked. A dark-brown costal streak just above the base of the cleft, connected broadly with the outer end of the discal streak, preceded and followed by white; another brown costal streak at the base of the first lobe, then narrowly white to apex. A white spot preceding base of cleft, connected obliquely by a fine white line to the outer costal white spot. Second lobe brown at tip, faint brown line down the centre, and a small square white spot one-third from base. Fringe smoky, darker within the cleft. Secondaries dull smoky brown, fringes darker. Expanse 21–26 mm. Palpi mottled light brown and white. Thorax dorsally brown; anterior part, buff. Abdomen light brownish-buff on anterior part, becoming almost seal-brown mottled with lighter on the anal segments.

Two specimens from Atlin. One is from the Bryant collection without date and the other was taken by E. M. Anderson on July 19th, 1914. They are both rather faded and a little worn. Dr. Lindsey made a slide of the genitalia of the latter to ensure the identification. Barnes and Lindsey also record a specimen from Wellington (Taylor) which is paler than typical. The type series was taken at San Diego, Cal., so that the species has an extensive range; it is also recorded from Arizona.

6. OIDÆMATOPHORUS PHOEBUS Barnes and Lindsey, Cont. Lep. No. Amer., Vol. IV., No. 4, page 406, 1921. Primaries whitish to light tawny brown, the palest area in the second lobe and along inner margin of first. Costa whitish towards base, sprinkled with blackish scales, paler towards apex. Cleft preceded at a short distance by a faint dark dot. Entire wing usually with some scattered black scales, tending to form streaks in the lobes and near the inner margin. Fringes pale on costa, elsewhere brownish-grey to brownish-black, contrastingly darker than wing. Secondaries brownish-grey with slightly darker fringes. Expanse 21–23 mm. Head brown with a whitish band between antennæ. Thorax whitish in front, becoming tawny behind. Palpi small, oblique, whitish, with traces of brown on third joint.

Described from four specimens from various localities in California. With these the authors have associated a specimen from New Westminster, which, however, is much paler than the type series. Neither the date of capture nor collector's name is given. Among the material sent from Kaslo was a specimen which was different to anything else that I had seen; it was submitted to Dr. Lindsey, who pronounced it this species. It was taken by Mr. Cockle on June 22nd, 1910.

7. OIDÆMATOPHORUS HELIANTHI Walsingham, Pter. Cal., Ore., 54, 1880. Primaries brownish—white to tawny with some scattered dark-brown scales. A short distance before the cleft and slightly toward inner margin there is a rounded dark-brown spot, well defined, which may be extended as much as half-way to the costa by an oblique line of dark scales, and occasionally the anterior extremity of this mark alone is evident as a spot much more vague than the first (this is the case in the British Columbia example before me) apex and inner margin of first

lobe with a row of dark dots. Fringes concolorous, those in cleft with dark areas just before apices of both lobes. Secondaries grey-brown, bases paler; fringes slightly more tawny. Expanse 21–29 mm.

The only record of this species in British Columbia are some specimens taken at South Fork, Kaslo Creek, by Mr. Cockle on August 10th, 1903. Other specimens sent by Mr. Cockle from Kaslo as this species are worn specimens of *occidentalis*. The type series was taken in the Siskiyou Mountains, South Oregon, and were bred from larvæ feeding on a species of *Helianthus*. The species has also been taken in Colorado.

8. OIDÆMATOPHORUS HOMODACTYLUS Walker, List. Lep. Ins. Brit. Mus., XXX., 941, 1864. Primaries snowy white, in some specimens with a slight irroration of brownish-grey in costal half. Cleft sometimes preceded at a short distance by a small brownish dot. Secondaries tinged with greyish. Head, thorax, and abdomen snowy white. The mid-tibiæ have a fringe of scales down the inside, but no tufts.

It is evidently a mountainous species in this Province, as our records are from Hope Mountains, July (Day and Harvey); Mount McLean, August (Day and Hanham); and Vavenby, August (Moilliet). The Mount McLean specimens were taken at an elevation of 5,000 feet. The species occurs throughout Canada from British Columbia to Quebec, south into New Jersey and Illinois. It has also been taken in California.

9. OIDÆMATOPHORUS STRAMINEUS Walsingham, Pter. Cal., Ore., 41, 1880.

Lioptilus augustus Walsingham, Pter. Cal., Ore., 43, 1880.

Primaries usually yellow or yellowish, occasionally somewhat ochreous. There is at least a trace of a brown spot contiguous to the base of the cleft; in some specimens this spot is well marked. In most specimens a heavy brown shade runs from the base next to the inner margin into the first lobe. Fringes more greyish. Secondaries greyish with fringes concolorous. Expanse 15–21 mm. Thorax yellow. Abdomen yellow with brown dorsal stripes. Palpi slender, moderate, oblique; tips of second and third joints touched with fuscous outside.

This is the species that is listed as *stramineus* in our local lists. *Stramineus* was described from specimens taken in the Siskiyou Mountains, South Oregon, in June, and *augustus* from a series taken on Mount Shasta, California, in August. The types are in the British Museum. Mr. Edw. Meyrick has compared specimens with the types for Messrs. Barnes and Lindsey, and the latter have also compared specimens with Fernald's paratypes and are unable to find any specific differences between them. The species is very variable in appearance, due to the inconstancy of the brown shade on the primaries. Mr. Day has taken a specimen at Quamichan Lake, near Duncan, the only record we have for Vancouver Island. The same collector also took the species in the Hope Mountains in 1908. Mr. Cockle has it from Kaslo and Dr. Dyar took a long series at Ainsworth in June and July, 1903. In his note on the species Dyar states that "The moths were easily started up from low grass and weeds, but especially from the plant *Anaphalis margaratacea*, which I suppose is their food-plant. Larvæ were found commonly in the flower-heads of this plant, but unfortunately were not bred."

10. OIDÆMATOPHORUS CORVUS Barnes and Lindsey, Cont. Lep. No. Amer., Vol. IV., No. 4, page 427, 1921. Primaries clear pale yellow in the lightest specimens, with some brown scales near base, sometimes a small brown dot a short distance before base of cleft, and sometimes a brown sub-costal shade which meets the costa in the first lobe. In the type series these wings have a pale-yellowish or greyish-yellow costal band from base to a point opposite base of cleft, in which the extreme costal margin bears some brown scales. Behind this the entire wing is clothed with brownish-grey mixed with very pale-yellowish scales, becoming more whitish toward inner margin. The spot before the cleft is faintly marked and is continued slightly toward costa to form a transverse shade. Costal fringes on first lobe yellowish, others dark greyish. Secondaries brownish-grey fringes concolorous. In pale specimens the secondaries appear dark in contrast to the yellow primaries. Expanse 17–20 mm. Palpi moderate, slender, oblique, yellowish-white with a brown outer line. Thorax pale yellow. Abdomen pale yellow to pale greyish-yellow with a fine light-brown dorsal line.

This new species was described from twenty specimens taken at Tuolumne Meadows and Deer Park Springs, Lake Tahoe, California. It has also been taken in Washington and Colorado.

It is apparently widely distributed in British Columbia, specific localities being Goldstream (Blackmore); Wellington (Bryant); Fraser Mills (Marmont); Kaslo (Cockle); and Cranbrook (Garrett).

The British Columbia specimens are very variable, both in size and in coloration. The Wellington examples are the largest, being 21–22 mm. in expanse, with the dark shades contrasting with the paler areas, which are a deep cream. A series from Goldstream average 18 mm. in expanse and are very pale, the ground colour being a sordid white, with the brown spot before cleft distinctly marked. Those from Fraser Mills are similar, but not quite so pale. Some Kaslo specimens are as pale as my Goldstream series, but a trifle smaller, although one specimen is larger than any, measuring 23 mm., and in addition is very much darker, the ground colour being dark brown. Dr. Lindsey has seen this specimen and pronounced it *corvus*, believing that the brown colour is due to age or some other cause. It was taken on June 20th, 1904.

The life-history and food-plant are unknown, although the series which I took at Goldstream in August, 1920, were all beaten from the common yarrow (*Achillia millefolium*), which may be its food-plant. I did not observe it on any other plant.

11. OIDÆMATOPHORUS MONODACTYLUS Linnæus, Syst. Nat. (Ed. 10), page 542, 1758. The colour of the primaries is very variable, ranging through shades of grey, yellow, and brown to various mixtures of these colours. The fore wings are very narrow, but have unusually long fringes at the anal angle of the second lobe. There is a black spot before base of cleft, sometimes extended to it, a dot in cell, some at tips of veins in both lobes, and some black scales streaking the wing near inner margin. Secondaries and fringes of both wings brownish-grey. Expanse 21–28 mm. Thorax similar to primaries. Abdomen brownish or greyish with some dark dashes, and a narrow dorsal stripe concolorous with thorax, which widens anteriorly and is usually margined with white toward its junction with the thorax. There is usually a crest of scales present on the upper surface of the hind tarsi.

This is our commonest species on Vancouver Island and it has been taken in every month of the year. The most common coloration is tawny, with a sprinkling of grey forms and a few red-brown ones. I have not seen any specimens from the Mainland, which is rather surprising, as it occurs right across the continent from the Atlantic to the Pacific and from Mexico to Canada. It also occurs in Europe, Asia, and North Africa. It feeds on a large number of different food-plants.

The following eight species recorded in the 1906 B.C. Check-list are omitted from this paper for the reasons given:—

Trichoptilus lobidactylus Fitch. Recorded from Wellington. I have examined the specimens labelled as this species in the Bryant collection and from which the records were taken for the above list, and find that they are all *Pterophorus delawaricus* Zeller without a doubt.

Oxyptilus (*Pterophorus*) *periscelidactylus* Fitch. Recorded from Wellington. The specimens labelled as such in the Bryant collection are *Platyptilia punctidactyla* Haw.

Platyptilia shastæ Wals. Recorded from Wellington. This was rather an extraordinary determination, as specimens bearing this label were undoubtedly *Oidæmatophorus cineraceus* Fish. A totally different insect and bearing no resemblance, either generically or specifically.

Platyptilia grandis Wals. and *Platyptilia modesta* Wals. Both recorded from Wellington. Specimens bearing these labels were nothing more or less than specimens of the common *carduidactyla*, which had apparently been separated according to their size; the latter species being very variable in this respect, as I have specimens ranging from 18 to 28 mm. in expanse.

Pterophorus (*Oidæmatophorus*) *brucei* Fern. Recorded from Shawnigan Lake by Dr. Dyar in his "Kootenai List." In his annotation, he states: "Two specimens . . . in poor condition, but seeming to agree with specimens from Colorado, so named for me by Dr. C. H. Fernald."

I am rather inclined to doubt the correctness of Dr. Dyar's determination of this species on the following grounds: (1) That *brucei* Fern. and *mathewianus* Zell. have a somewhat superficial resemblance; (2) that Dr. Dyar's specimens were in poor condition and he himself was not positive that they were conspecific with his Colorado specimens of *brucei*; (3) that apparently Dr. Dyar did not have at that time specimens of *mathewianus* for comparison; (4) that specimens sent to me by Mr. Cockle, of Kaslo, as *brucei* have been determined by Dr. Lindsey as *mathewianus;* and (5) that of 250 specimens of this family recently examined from many diverse localities in the Province, not a single specimen turned up which has been even doubtfully referred to *brucei*. Taking all these facts into consideration, it is more reasonable to suppose that Dr. Dyar's specimens were in reality *mathewianus*, which was originally described from Vancouver Island. Until undoubted specimens of *brucei* are taken in British Columbia I think it is better to eliminate this species from our B.C. Check-list.

Pterophorus (*Oidæmatophorus*) *paleaceus* Zell. Recorded from Wellington. Specimens under this name in the Bryant collection did not seem to agree with the description of that species and were submitted to Dr. Lindsey, who pronounced them to be "rather large specimens of *corvus* B. & L., not quite typical, but certainly not *paleaceus* Zell."

Pterophorus (*Oidæmatophorus*) *eupatorii* Fern. This record in our list was copied from Dyar's Catalogue (Bull. 52, U.S.N.M.), wherein he gives Vancouver Island, together with New York and California, as localities for this species. Barnes and Lindsey in their "Revision" give a detailed discussion of *eupatorii* Fern., *guttatus* Wals., and *mathewianus* Zell., three very closely allied species and which have given rise to a great deal of confusion in the past. The conclusions arrived at show that *eupatorii* is distinctly Eastern and does not occur on the Pacific slope.

In concluding this paper on the British Columbia Pterophoridæ, I would like to point out two important pieces of biological work that remain for our local entomologists to undertake, and that is the working-out of the life-histories of (1) *Platyptilia pallidactyla* Haw. and *pica* Wals., and (2) *P. carduidactyla* Riley and *percnodactyla* Wals. Careful breeding from the ova of known females, full notes on the different larval instars, together with careful comparison of the resulting imagines, will do much to prove the specific identity or otherwise of the species indicated.

The following family, with its one North American species, is included here as it is so very closely allied to the Pterophoridæ.

FAMILY ALUCITIDAE LINN.

Genus ALUCITA Linn.

Alucita Linnæus, Syst. Nat. (Ed. X.), 1. 542, 1758.

Orneodes Latreille, Precis. Car. Ins. 148, 1796.

Characters: Ocelli present. Proboscis well developed. Labial palpi strong. Both primaries and secondaries deeply cleft into six lobes each. The under-surface of the secondaries lacks the black scales which occur in the Pterophoridæ, and the legs are of normal length.

1. **Alucita montana** Cockerell, Ent. Mo. Mag., XXV., 213, 1889.

Orneodes hexadactyla Fernald (not Linn.), List. Lep. No. Amer., 88, 1891.

Primaries greyish-tawny, crossed by a wide dark-brown median band margined narrowly with white, which forks on the first two lobes; a subterminal band, narrower on the first two lobes, is also margined with white. Secondaries checkered with dark brown, tawny, and white.

This species is the *Orneodoes hexadactyla* of our local lists, a European species with which our North American species has generally been considered conspecific, but according to Barnes and Lindsey *hexadactyla* is much lighter and more ochreous in general appearance and entirely lacks pure white scales.

Montana has a wide distribution in North America, occurring from Vancouver Island to Ontario and from New York to California.

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VICTORIA, B.C.
Printed by William H. Cullin, Printer to the King's Most Excellent Majesty.
1922.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1922

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1923.

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1923.

To His Honour Walter Cameron Nichol,

Lieutenant-Governor of the Province of British Columbia.

May it please Your Honour:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History for the year 1922.

J. D. MacLEAN,

Provincial Secretary.

Provincial Secretary's Office,

Victoria, B.C., February, 1923.

Provincial Museum of Natural History,
Victoria, B.C., February 19th, 1923.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ending December 31st, 1922, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,

FRANCIS KERMODE,
Director.

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DEPARTMENT OF THE PROVINCIAL SECRETARY.

The Honourable J. D. MacLean, *Minister.*

J. L. White, *Deputy Minister.*

PROVINCIAL MUSEUM OF NATURAL HISTORY.

Staff:

Francis Kermode, *Director.*

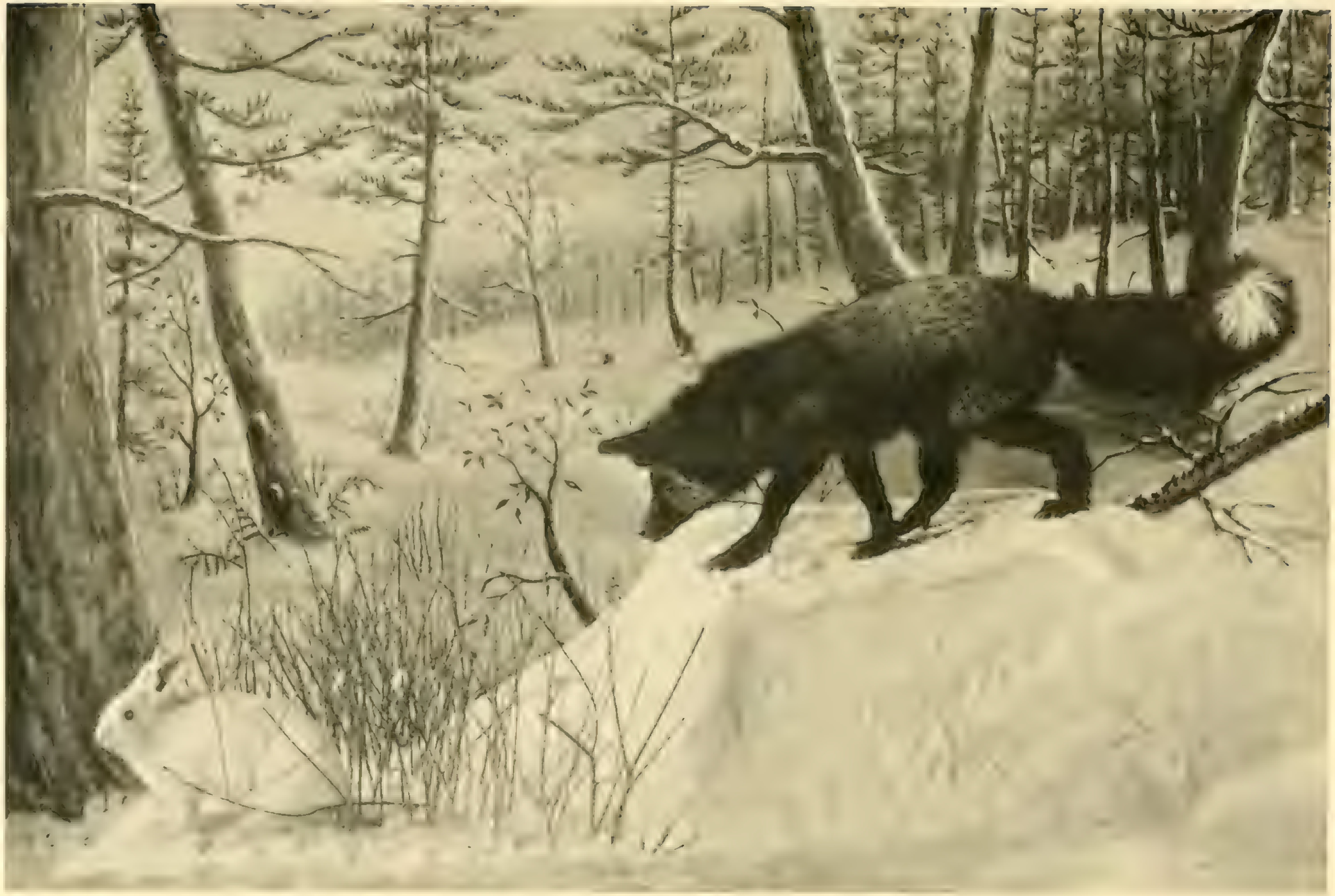
Winifred V. Redfern, *Recorder.*

William R. Carter, *Assistant Biologist.*

Ernest H. Blackmore, *Associate Curator of Entomology.*

Reginald W. Park, *Attendant.*

Edward A. Cooke, *Attendant.*



SILVER FOX, VULPES FULVUS ARGENTATUS (SHAW).
Group in Provincial Museum, Victoria, B. C.

REPORT *of the*

PROVINCIAL MUSEUM OF NATURAL HISTORY

FOR THE YEAR 1922.

By Francis Kermode, Director.

OBJECTS.

(*a.*) To secure and preserve specimens illustrating the natural history of the Province.

(*b.*) To collect anthropological material relating to the aboriginal races of the Province.

(*c.*) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and diffuse knowledge regarding the same.

ADMISSION.

The Provincial Museum is open, free, to the public daily throughout the year from 9 a.m. to 5 p.m. (except New Year's Day, Good Friday, and Christmas Day); it is also open on Sunday afternoons from 1 p.m. to 5 p.m. from May 1st until the end of October.

VISITORS.

The actual number of visitors whose names are recorded on the register of the Museum is 21,307, against 22,550 in last year's report. This does not by any means give the total number of visitors throughout the year, as not only have more visitors been noticed, but the attendance of school classes has greatly increased, while the classes from the Normal School have used the collections considerably in regard to making drawings in connection with their nature-studies. I would recommend that a turnstile or some other way of recording the number of visitors accurately be installed. The following figures will give some idea of those who recorded their names during the months of: January, 698; February, 872; March, 915; April, 1,087; May, 1,231; June, 2,131; July, 4,561; August, 4,830; September, 2,377; October, 1,135; November, 780; December, 660.

ACTIVITIES.

In last year's report it was mentioned that the Public Works Department had completed the basement, and the carpenter having made four extra cases for the display of exhibits, all the anthropological material which had for a number of years been exhibited on the main floor in the northern section of the exhibition halls was transferred to its new quarters. Four other cases are in the course of preparation, and a temporary arrangement has been made to exhibit the specimens until the four cases are completed and the extra two rooms available for the display of exhibits, making a total of six rooms in the anthropological halls. It is hoped to have this completed early in the spring and the collection will then be labelled and arranged as a permanent exhibit, as there is no more space available in the present building.

A temporary arrangement of these specimens was made in the spring of 1922, and the formal opening of the exhibition halls to the public was inaugurated by a special meeting of the Natural History Society of British Columbia, held in the Provincial Museum on May 29th, 1922, when an illustrated lecture was given by the Director on the "Early Customs and Life of the Aboriginal Races of this Province," which was well attended by the members of the society and their friends. The lecture was given on the main floor, the mammals in cases and other specimens being moved to one side so as to give as much space as possible for those who attended. The Department is handicapped, as in the construction of the present building there is no room available for scientific lectures of this kind for the general public, although offers to give lectures have been received from different scientists who have visited the Department from time to time.

Mr. Harlan I. Smith, Anthropologist of the Dominion Government, Ottawa, also gave a lecture in the Museum on September 14th, 1922, upon his return from his explorations in the Bella Coola country, where he has been doing anthropological research-work for the last three summers. His lecture, "The Relationship of Museum Work to Education," was given on the main floor of the Museum, but the space provided was barely sufficient for the accommodation of members of the Natural History Society and their friends, who displayed deep interest in the lantern-slides illustrating the work carried on by the larger museums in Eastern Canada and the United States. These slides Mr. Smith very kindly had his Department send from Ottawa for the occasion.

Two other lectures were given for the Natural History Society, one on "Bird Life of the Western Country," with illustrations, given by Miss Elizabeth Racey, of Portland, Oregon, and the other by Dr. Franz Boas, of Columbia University, New York, on "Indians of British Columbia: their Customs, Folk-lore, and Habits." These lectures were held in the Girls' Central School and were attended by large and appreciative gatherings.

At the request of the Honourable John Oliver, Prime Minister, the Museum was open during the evening of September 21st, 1922, for the members of the Montreal Board of Trade, who were accompanied on their trip across Canada by a number of British Parliamentarians. They were conducted through the Department by the Honourable the Premier, and numbers of them expressed their gratitude, and were agreeably surprised at the showing this Province has made in the exhibit of natural-history specimens.

ANTHROPOLOGY.

In the early part of the year the Director took up with Mr. R. G. Cunningham, of Port Essington, the advisability of his loaning to the Department his very valuable collection of Indian stone carvings, which have been in his possession for many years. Mr. Cunningham willingly consented to place on exhibition for an indefinite time the whole of this collection, numbering approximately fifty-five specimens.

These carvings are exceptionally good pieces of work, above the average that is done by the Haida Indians, who are the expert carvers of the North Pacific Coast, and exceed all other tribes in their totem designs, both in workmanship and skill. Of these stone carvings, some were made by the late Henry Edensaw, a chief of the Masset Tribe of the Haida Indians of the Queen Charlotte Islands, who lived to be a very old man, dying a few years ago; others were carved by a man named Abraham, a cripple, born of slave parents who were taken slaves by the Haidas from another tribe many years ago.

The material these carvings are made of is a form of black slate which is rather soft when first taken from the deposits found at Skidegate Inlet, Queen Charlotte Islands. After being carved this material is polished with oil and takes a very brilliant finish.

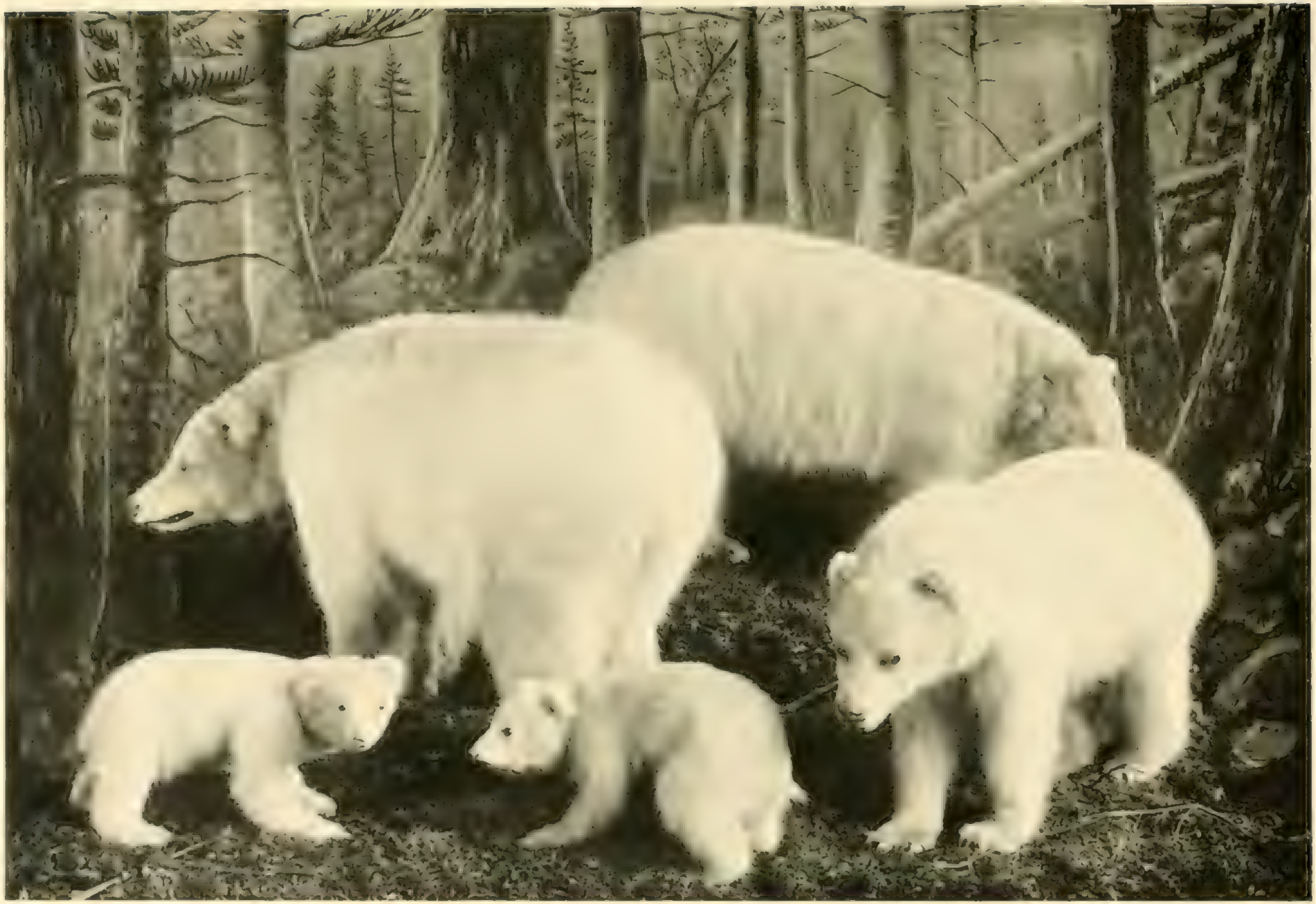
This exhibition of totem-poles illustrates the stories and legends of the Haida Indians. The exhibit is in a plate-glass case on the main floor, and may be seen by all visitors entering the Department before visiting the anthropological halls in the basement.

In the early spring, when the anthropological collection was being transferred to the basement, three extra totem-poles were arranged in the main entrance. One is a large house-pole, No. 2309, collected by Dr. C. F. Newcombe, 1913, at Talio, South Bentinck Arm, B.C. It is of cedar with a hollowed back, large doorway at bottom, painted yellow, blue, green, white, and black. The lower figure has a short beak and there are two smaller birds three-quarters of the way up the pole. Size, 17 feet 3 inches by 4 feet 2 inches by 2 feet 6 inches.

Two other house-poles were also placed in the entrance hall; No. 2355, used in the interior of the house, is of cedar, with the eagle carved on the top and the ancestor of the owner below. Size, 14 feet 7 inches by 22 inches. No. 2356 is the companion to No. 2355. These two poles stood inside a house, supporting the roof. Collected at Comox, B.C., 1912, by C. F. N.

At the time these poles were placed in position, the Director thought it advisable to remove the two oil paintings of Alert Bay Indian Village from the entrance hall to the hall where the stair-case leads to the anthropological section. A large totem-pole which had been in storage for a number of years was also erected near the stairway. This totem, No. 1863, is of cedar, carved, and painted red, black, and grey. The top is the copper which the chief or owner is holding up (holding up his tribe); then comes the chief's figure; then the raven (his crest), and the man underneath is the enemy chief of the chief who is holding the copper. He is treading on his enemy. Size of pole, 26 feet by 21 inches by 18 inches. Collected at Tsawadi Village by C. F. N.

A number of other totem-poles, house-poles, and canoes, with several more Indian antiquities too large for exhibition in the present halls, have still to remain in storage in another building



KERMODE'S WHITE BEAR URSUS KERMODEI (HORNADAY)
(Type Specimen.) Group in Provincial Museum, Victoria, B. C.

indefinitely until space is provided by the erection of a new museum. This had been the intention for some time, but owing to financial conditions the matter has been left in abeyance, but it is to be hoped that the time will soon come when arrangements will be made for the erection of a building large enough to house this valuable anthropological material.

While undergoing these changes this year the Museum was visited by a number of the leading scientists and anthropologists of America who were in Victoria during the summer, among whom were: Dr. Franz Boas, Anthropologist, Columbia University, New York, U.S.A.; J. C. Bond, Curator, McMahon Museum, Quetta, Baluchistan, India; Professor J. K. Beattie, Bureau of Plant Industry, U.S. Department of Agriculture, Washington, D.C., U.S.A.; Lieut.-Colonel G. T. Emmons, Princeton, N.J., U.S.A.; Dr. Goddard, American Museum of Natural History, New York, U.S.A.; George Heye, Director, Museum of American Indian (Heye Foundation), New York, U.S.A.; M. Hall McAllister, California Academy of Sciences, San Francisco, Cal., U.S.A.; Dr. Leonhard Stejneger, Smithsonian Institution, U.S. National Museum, Washington, D.C., U.S.A.; Harlan I. Smith, Archæologist, Victoria Memorial Museum, Ottawa, Can.; Charles Piper Smith, Botanist, San Jose, Cal., U.S.A.

All these gentlemen were greatly impressed by the move the Department was making in displaying the anthropological material which had been secured many years ago, and were surprised that we had been able to gather so much of valuable material in regard to the aboriginal races of this Province, material which is now in safe-keeping and will be preserved for the education of the rising generation. It shows the stone age, industry, home life, customs, etc., of the Indians of this North-west Coast.

Dr. Franz Boas, of Columbia University, U.S.A., while in the city had arranged to have Mr. George Hunt, an Indian from the Fort Rupert Reservation, assist him on a revision of some of his writings on the Kwakiutl Indians, and as our anthropological collection was being arranged at the time, advantage was taken by the Department of Mr. Hunt's visit.

With the permission of the Deputy Provincial Secretary, the Department engaged Mr. Hunt for several days to go over the Kwakiutl specimens, in order to have reliable data and information at first hand for the labels on the specimens when finally arranged. Mr. Hunt, having spent all his life on a reserve with his own people, knows well their early customs. He also gave us the Indian names of many of the plants that are used by the Indians for food and medicine.

Dr. C. F. Newcombe, who is noted as one of the leading anthropologists of the North-west Coast, has offered to assist the Director to arrange the collection permanently during the coming year. This will necessitate an immense amount of work, as all specimens will have to be relabelled, and it is intended to give explanatory notes on their designs and uses by the natives, only temporary labels being attached at the present time.

The Department has been very fortunate this year in receiving collections of Indian relics as gifts. Mr. Victor B. Harrison, of Nanaimo, B.C., presented a collection which comprises the following:—

Salishan (Coast).

No. 3177. Stone pestle.
„ 3178. Stone pestle.
„ 3179. Stone pestle.
No. 3187. Copper bracelet, found on skeleton of a woman.
„ 3188. Bone handle for stone knife.

Salishan (Lillooet).

No. 3183. Stone paint-dish of turtle design.

Salishan (Thompson).

No. 3184. Stone Indian pipe.
„ 3185. Bone needle.
„ 3186. Stone needle.
No. 3189–4006. Stone arrow-heads.
„ 4007–4020. Stone spear-heads.
„ 4021–4025. Fragments of arrow-heads.

Salishan (Shuswap).

No. 3180. Jade chisel.
„ 3181. Jade chisel.
„ 3182. Jade chisel.
No. 4026. Whetstone.
„ 4027. Rubbing-stone.

In this collection, No. 3183, which is a soapstone dish, is of special interest, being a very fine piece of work.

Miss Alice Turner, Victoria, B.C., presented the Department with some very beautiful work done by the Blackfeet Indians, consisting of:—

No. 3168. Chief's coat, deer-skin.
„ 3169. Pair of chaps, deer-skin, beaded design.
„ 3170. Large leather belt, buffalo-hide.
„ 3171. Pair of leather leggings, beaded design.
„ 3172. Pair of leather leggings, beaded design.
„ 3173. Leather belt, beaded design.
„ 3174. Leather belt, beaded design.
„ 3175. Pair of leather moccasins, beaded design.
„ 3176. Peace-pipe, bowl of stone and stem of alder.
„ 4028. Pair of leather moccasins, beaded design.
„ 4029. Pair of leather moccasins, beaded design.
„ 4030. Pair of wristlets, beaded design.
„ 4031. Peace-pipe, bowl of stone and stem of wood, with beads.
„ 4032. Peace-pipe, bowl of stone and stem of wood.
„ 4033. Peace-pipe, bowl of stone and stem of wood.
„ 4034. Peace-pipe, bowl of stone with a hand on it. Stem of three-cornered wood with two red knobs.
„ 4035. Peace-pipe, bowl of stone and stem of wood.
„ 4036. Bowl of peace-pipe.
„ 4037. Bowl of peace-pipe.
„ 4038. Bowl of peace-pipe, carved.
„ 4039. Bowl of peace-pipe, stone, carved in the shape of an animal.

Mr. Harlan I. Smith, Archæologist, Victoria Memorial Museum, Ottawa, very kindly sent to the Museum eight casts of prehistoric petroglyphs, or pictures on rocks near Bella Coola, B.C., with the following note:—

Casts of Prehistoric Petroglyphs, or Pictures on Rocks, near Bella Coola, B.C.

There are many of these pictures on top of the western edge of the canyon of the creek that empties into Bella Coola River some 3 miles above its mouth. They are at the top of the rise in the creek-valley immediately above the Bella Coola bottom lands, or about a mile from the river. The canyon is here about 70 feet deep. The pictures are on felsite rock, which is hard when freshly broken, but is decomposing into clay and is very soft where weathered. One petroglyph near by is on a granitic rock. Most of them were made by pecking, a very few by incising.

They must be ancient, as the moss with which they were overgrown in places reached a thickness of about a foot and some were covered by the roots of trees. Besides, only a few Indians knew of their existence and they only of the large southern group. They had never seen or heard of the several other exposures from which the casts here shown were made. They say that a family had "power" under a large rock near by. They pecked out the pictures in time to songs which were sung in connection with this "power." Not even the oldest Indians know what any of the pictures represent. This family had a ceremonial house immediately south of the largest exposure, and the hunting-trail up the valley passed over part of the petroglyphs and through the house.

Exploration and moulding
by Harlan I. Smith, 1921.
Casting by Edward Perron.
Coloring by Claude E. Johnson.

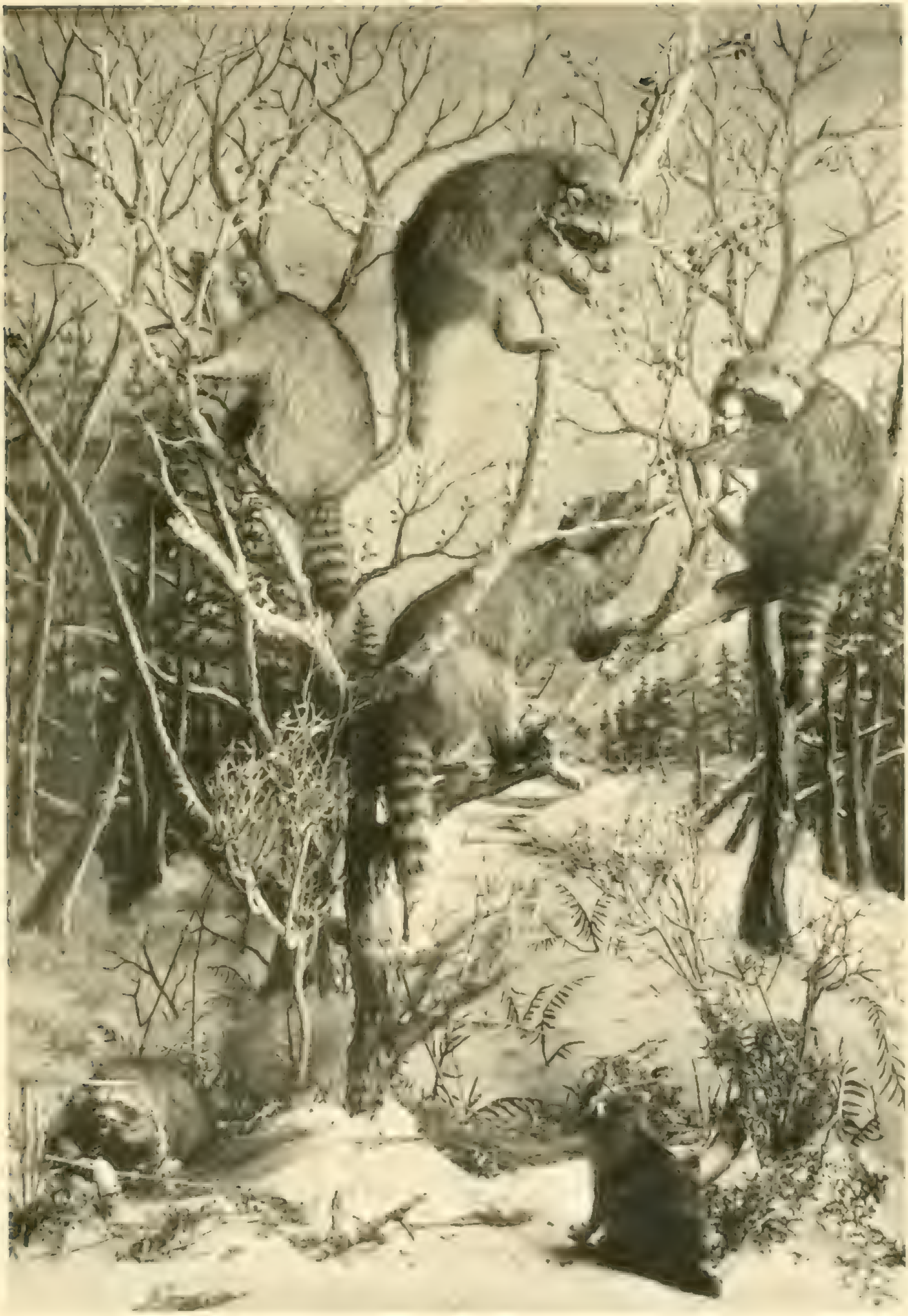
Cat. Nos. XII-B-1492c (1), XII-B-1498c (7), XII-B-1497c (6), XII-B-1493c (2), XII-B-1495c (4), XII-B-1496c (5), XII-B-1494c (3), XII-B-1499c (8).

ACCESSIONS.

Long-eared Owl (*Asio wilsonianus*). Presented by Mr. W. Long, Victoria, B.C., January 24th, 1922.

American Coot (*Fulica americana*). Presented by Dr. White, Elk Lake, B.C., February 2nd, 1922.

American Crossbill (*Loxia curviostra minor*). Presented by Mr. Dennis Ashby, Duncan, B.C., February 6th, 1922.



RACCOON PROCYON LOTOR (LINN.)
Group in Provincial Museum, Victoria, B. C.

Northern Shrike (*Lanius borealis*). Presented by Mr. W. Long, Victoria, B.C., February 26th, 1922.

Cooper's Hawk (*Accipter cooperi*). Presented by Mr. W. Long, Victoria, B.C., February 13th, 1922.

Red-breasted Merganser (*Mergus serrator*). Presented by Mr. E. V. Blatstone, Victoria, B.C., March 4th, 1922.

Western Robin (albino) (*Merula migratoria propinqua*). Presented by Mr. Dennis Ashby, Duncan, B.C., April 1st, 1922.

Avocet (*Recurvirostra americana*). Presented by Mr. A. Brooks, Okanagan, B.C., April 22nd, 1922.

Blue-winged Teal (*Querquedula discors*). Presented by Mr. A. Brooks, Okanagan, B.C., April 22nd, 1922.

Western Robin (albino) (*Merula migratoria propinqua*). Presented by Mr. Dave Ferrier, Alberni, B.C., August 21st, 1922.

Clarke's Nutcracker (*Nucifraga columbiana*). Presented by Mrs. H. Rawlins, Errington, B.C., September 2nd, 1922.

Fox Sparrow (*Passerella iliaca iliaca*). Presented by Mr. E. G. Kermode, Victoria, B.C., September 8th, 1922.

White Pelican (*Pelecanus erythrorhynchos*). Presented by Mr. J. Bessonette, Victoria, B.C., October 10th, 1922.

Western Robin (*Planesticus migratoria propinqua*). Presented by Dr. Knight, Victoria, B.C., October 10th, 1922.

Mourning Dove (*Zenaidura macroura*). Presented by Mrs. H. Rawlins, Errington, B.C., October 9th, 1922.

Nest and two eggs of Canada Jay (*Perisoreus canadensis canadensis*). Presented by Mr. V. Schjelderup, Burns Lake, B.C., May 4th, 1922.

Four eggs of Chinese Starling (*Acridotheras cristatellus*). Presented by Mr. R. A. Cumming, Vancouver, B.C., November, 1922.

Four eggs of Tule Wren (*Telmatodytes palustris paludicola*). Presented by Mr. R. A. Cumming, Vancouver, B.C., November, 1922.

Ratfish (*Hydrolagus colliei*). Presented by Mr. A. W. Stevenson, Victoria, B.C., September 25th, 1922.

Rock-boring Clam found on coal at Race Rocks, B.C. Presented by Captain W. E. Gardner, October, 1922.

Hair-worm (*Phreoryctes manheanus*) found at Salmon Arm, B.C., October, 1921. Presented by Dr. E. Buckell, January, 1922.

Fossil found at Lost Creek, B.C., and presented by Mr. A. Jenkins, September 1st, 1922.

Beetle, Giant Wood-borer (*Prionus californicus*). Presented by Mr. A. J. Marsh, Duncan, B.C., February 2nd, 1922.

Two Beetles (*Creocephalus obsoletus?*). Presented by Mr. H. R. Eldridge, Victoria, B.C., August, 1922.

Two specimens of Geometridæ (*Hydriomena nubilofasciata*) captured at Sluggett, B.C., and presented by Mr. W. Downes, March 2nd, 1922.

Moth (*Sphinx vancouverensis*). Presented by Miss Doreen Dodd, Telegraph Creek, B.C., July 13th, 1922.

Arrow-head found at Deer Park, Arrow Lake, B.C., 1909. Presented by Dr. Angus W. Kenning, Victoria, B.C., May 12th, 1922.

Stone pestle. Presented by Major Hodgins, Duncan, B.C., June 8th, 1922.

Stone paint-dish found in 1916 at Parson's Bridge, B.C. Presented by Mr. and Mrs. J. R. Hodgson, June 27th, 1922.

Collection of Indian curios. Presented by Miss Alice Turner, Victoria, B.C., November, 1922.

Collection of Indian curios. Presented by Mr. V. B. Harrison, Nanaimo, B.C., December, 1922.

Eight casts of prehistoric Petroglyphs near Bella Coola, B.C. Presented by Harlan I. Smith, Archæologist, Ottawa, December, 1922.

Vertebra of a Bison found July, 1922, at McCullock Station, B.C., in blue clay about 10 feet from the surface, while building a dam at an elevation of 4,000 feet. Presented by Mr. C. C. Fuller, Victoria, B.C.

Fragment of a Bison-horn collected by Dr. C. F. Newcombe in March, 1914, at the corner of Bay and Cook Streets, Victoria, B.C., where excavations were being carried on. Presented December, 1922.

PUBLICATIONS OF OTHER INSTITUTIONS.

(Alphabetically arranged.)

American Museum of Natural History, New York	3
Art Institute of Chicago, Illinois	5
Bernice Pauahi Bishop Museum, Honolulu, Hawaii	9
Boston Society of Natural History, Boston, Mass.	1
Bristol Museum and Art Gallery, Bristol, England	1
Brooklyn Institute of Arts and Sciences, Brooklyn, N.Y.	1
Bureau of Science, Manila, P.I.	4
California Academy of Sciences, San Francisco, Cal.	15
California University, Berkeley, Cal.	17
Cardiff Museum, Cardiff, Wales	1
Carnegie Museum, Pittsburgh, Pa.	1
Charleston Museum, Charleston, S.C.	1
Children's Museum of Boston, Boston, Mass.	2
Cincinnati Museum Association, Cincinnati, Ohio	1
City Art Museum, St. Louis, Mo.	2
Colorado Museum of Natural History, Denver, Col.	1
Cornell University, Ithaca, N.Y.	23
Detroit Institute of Arts, Detroit, Mich.	4
Dominion Government Publications, Ottawa	42
Erie Public Library, Erie, Pa.	1
Field Museum, Chicago, Ill.	9
Grand Rapids Public Library, Mich.	2
Gray Herbarium, Harvard University, Cambridge, Mass.	2
Illinois State Natural History Survey, Urbana, Ill.	5
Instituto General y Tecnico de Valencia, Valencia, Spain	4
John Crerar Library, Chicago, Ill.	1
Library of Congress, Washington, D.C.	1
Manchester Museum, Manchester, England	1
Manitoba University, Winnipeg, Man.	1
Minneapolis Institute of Arts, Minn.	7
Minnesota University, Minn.	4
Museum of the American Indian (Heye Foundation), New York	6
Museum of Fine Arts, Boston, Mass.	2
National Museum, Philadelphia, Pa.	1
National Museum, Melbourne, Australia	1
Newark Museum Association, Newark, N.J.	2
Nebraska University, Lincoln, Neb.	3
New South Wales Department of Agriculture, Australia	7
New York Botanical Garden, N.Y.	1
New York State College of Forestry, Syracuse, N.Y.	4
New York State Museum, Albany, N.Y.	2
Ohio Agricultural Experimental Station, Wooster, Ohio	3
Oklahoma University, Norman, Okla.	1
Peabody Museum, Salem, Mass.	1
Peabody Museum, Yale University, New Haven, Conn.	15
Pennsylvania Museum and University	6
Public Museum, Milwaukee, Wis.	1
Roger Williams Park Museum, Providence, R.I.	4
Royal Scottish Museum, Edinburgh, Scotland	1
Smithsonian Institution, Washington, D.C.	31
Carried forward	264

PUBLICATIONS OF OTHER INSTITUTIONS—*Continued.*

Brought forward	264
Statem Island Institute, New Brighton, N.Y.	10
Syracuse Museum of Fine Arts, Syracuse, N.Y.	2
United States Department of Agriculture, Washington, D.C.	12
University of Montreal, Montreal, Que.	1
University of Washington, Seattle, Wash.	2
Zoological Society, New York, N.Y.	9
Zoological Society, Philadelphia, Pa.	2
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BOTANY.

By W. R. Carter.

The past season cannot be looked upon as ideal from a collector's point of view, owing to the very long, dry spell which extended over a great portion of this Province, many areas becoming dried up early in the summer; this, coming after a late and bleak spring, had a marked effect on vegetation.

In some localities it was so dry many plants withered in bloom without going to seed, and noticeable instances of this were observed in the exposed portions of the Malahat, on Vancouver Island.

After heavy rains the latter part of August and beginning of September, warm weather with much sunshine continued late on in the fall, plant-growth took on a new lease of life, and many flowers were noticed in bloom long past their usual period.

With the exception of collections made by Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, and Mr. G. V. Copley, of the Provincial Grazing Commission, very little material has been added to the Herbarium of the Provincial Museum from other sources. However, from the enterprise of these two gentlemen a considerable amount of very desirable material has been added to the collection, including several new records for this Province and a number of specimens not hitherto in the collection.

Mr. W. B. Anderson in his official capacity covered a very large area of the Province, and presented us with many specimens representing the flora of the Windermere District, Fort Steele, Mount McLean, Mount Cheam, Penticton, Keremeos, and adjacent localities in the south.

Mr. G. V. Copley's specimens were principally collected from the country surrounding Merritt, Kamloops, and a portion of the Chilcotin District; also a nice collection from the southern portion of Vancouver Island. His specimens include a few plants from the higher altitudes of the districts in which he collected, and some very desirable material from what may be called the alkaline marshes of the Interior.

Mr. R. Glendenning, Junior Entomologist, Dominion Experimental Farm, Agassiz, B.C., presented us with specimens of *Allium attenuifolium* Kellog, which he collected at Maple Bay, V.I., and listed in his 1918 "Check-list of the Flowering Plants and Ferns growing in the Cowichan District, V.I." These specimens were submitted to Professor C. V. Piper, of Washington, D.C., and Mr. Glendenning's determination has been verified.

Specimens from Alberni, V.I., referred to as *Allium Geyeri* Wats., have also been identified as *A. attenuifolium;* there appears now to be some doubt as to whether *A. Geyeri* occurs on Vancouver Island, although specimens from Sidney, V.I., collected by the late Professor Macoun are so named. It is to be hoped more material from this locality may be collected in the near future, in order that any existing doubt may be removed.

Dr. C. F. Newcombe, of Victoria, donated several specimens which he collected at Bella Coola, Skeena River, and Vancouver Island, several of which extend their range of distribution as previously recorded in this Department.

Professor George B. Rigg, of the University of Washington, reports collecting *Rubus Chamæmorus* Linn. near Duncan, V.I., in the Cowichan District, its former station being near Comox Lake, Macoun; this record extends the distribution of the species much to the south on Vancouver Island.

One of the most interesting plants collected during the past season is *Myrica californica* Cham. near Tofino, on the west coast of Vancouver Island. Through the offices of Mr. George

Fraser, of Ucluelet, V.I., Captain J .W. Thompson sent us large fruiting specimens of this shrub-like tree, which was originally discovered on his property about 4 miles from Tofino by Mrs. T. B. McBey, of Cameron Lake, September 4th, 1920.

Captain Thompson reports having a straight, almost unbroken hedge of it nearly 200 feet in length, and, apart from this, has only been able to locate two isolated specimens outside and in the immediate vicinity of his property.

As no former record can be found of this species having been collected in British Columbia, this is the first authentic Canadian record, and has recently been recorded by Dr. C. F. Newcombe as such in the "Canadian Field Naturalist," Vol. XXXVI., No. 6, September, 1922.

During the year we have been honoured by a number of visitors seeking information on our native flora, and it is gratifying to report the Herbarium has been used as a source of reference by several specialists and students from the United States Department of Agriculture, and other institutions, in their particular research of different genera.

A number of duplicate specimens have also been distributed as follows: To Mr. C. P. Smith, of Los Angeles, California, who is monographing the Lupines of the Pacific States; Miss Helen Bergfried, Associate in Botany, University of California, studying the genus Crepis; a set of Rubus has been sent to Mr. C. E. Gustafsson, Tralleborg, Sweden, who is working on this genus; and a few specimens of Carices have been sent to Professor J. K. Henry, late of the University of British Columbia, who is continuing his research in this order.

The greater portion of the specimens received this year, not previously represented in the Herbarium, have been mounted and placed in the collection; others will be mounted showing range of distribution; and a few difficult species are as yet undetermined.

Throughout the season we have, as usual, been pleased to identify a large number of plants for school-children, teachers, and other collectors; there is still room for a great deal of improvement in the condition in which many of these plants are submitted for examination.

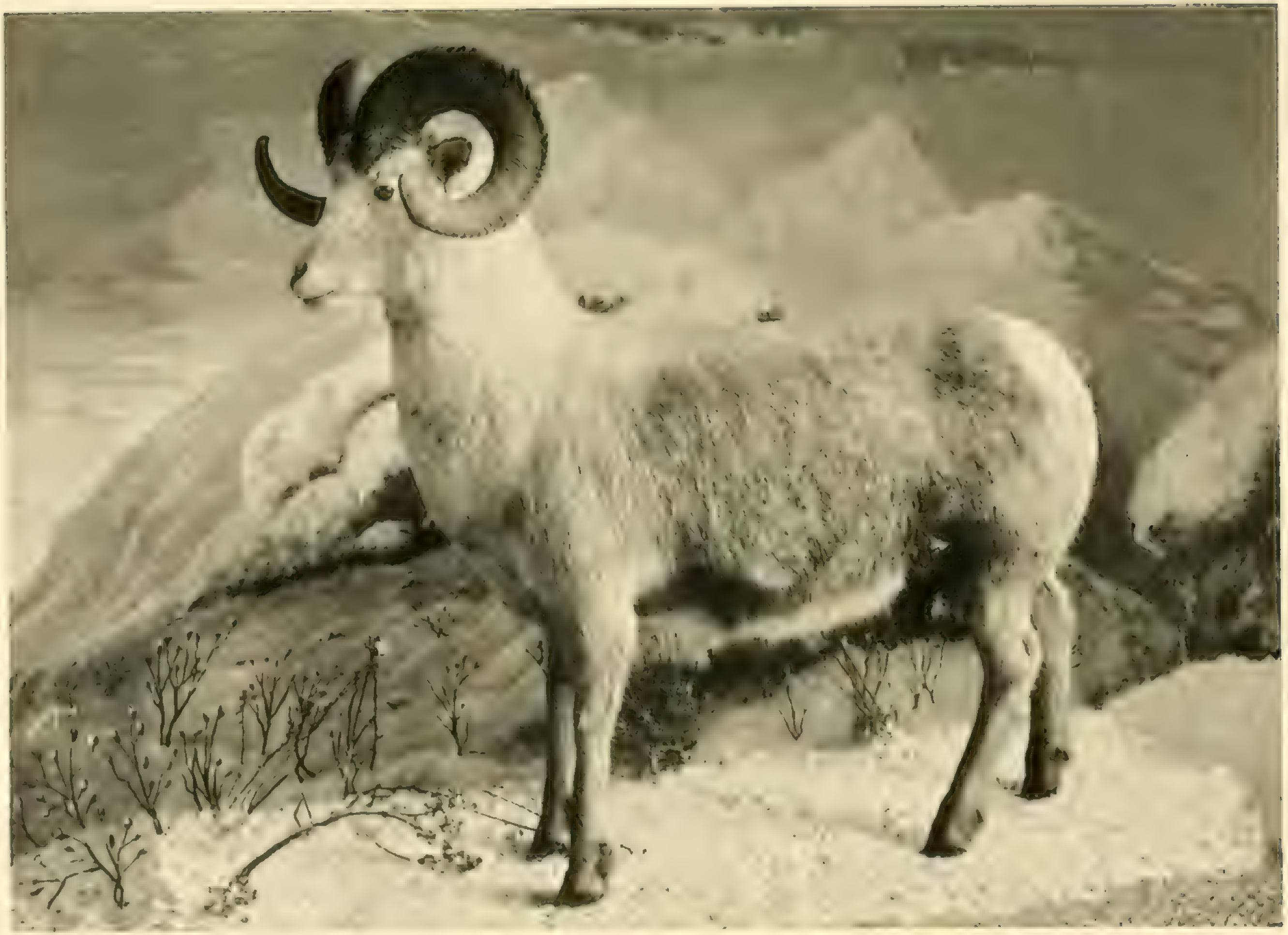
The thanks of this Department are cordially extended to the following gentlemen: Professor C. V. Piper, of Washington, D.C., for his kindness in determining a number of species, which has been of great assistance to this Department. Mr. C. P. Smith, of Los Angeles, California, who examined our collection of Lupines while here on a visit during the summer. Dr. C. F. Newcombe, Mr. W. B. Anderson, Mr. T. P. MacKenzie, Mr. G. V. Copley, Mr. R. Glendenning, and Mr. P. de Noe Walker, for the keen interest they have taken and for the material they have donated.

Among the most interesting plants collected by Mr. W. B. Anderson are the following:—

Juncus acuminatus Michx.
Juncus tenuis Willd.
Cypripedium passerinum Rich.
Salix cascadensis Cockerell.
Corispermum hyssopifolium L.
Clematis columbiana Hornem.
Mitella nuda L. (in part).
Potentilla flabellifolia Hook.
Astragalus debilis (Nutt.) A. Gray.
Astragalus (*glareosus* Hook.?).
Hedysarum Mackenzii Rich.
Oxytropis deflexus (Pall.) DC.
Epilobium luteum Pursh.
Hippuris montana Ledeb.
Sanicula marilandica L.
Gentiana propinqua Rich.
Cynoglossum officinale L.
Mertensia subcordata Greene.
Myosotis alpestris Schmidt.
Verbena bracteosa Michx.
Pentstemon attenuatus Dougl.
Pentstemon eriantherа Pursh.
Pentstemon pruinosus Dougl.
Lonicera glaucescens Rydb.
Arnica arcana A. Nels.
Artemisia longepedunculata Rud.
Aster campestris Nutt.
Aster Geyeri (Gray) Howell.
Aster meritus A. Nels.
Bidens dentata (Nutt.) Wiegand.
Erigeron elatus (Hook.) Greene.
Euthamia occidentalis Nutt.
Helianthus Nuttallii T. & G.
Lactuca pulchella (Pursh) DC.
Petasites frigida (L.) Fries.
Senecio Howellii Greene.

Mr. G. V. Copley's contributions include:—

Triglochin palustris L.
Cynosurus echinatus L.
Carex disperma Dewey.
Eriophorum Chamissonis Mey.
Thelypodium laciniatum Endl.
Cryptanthe Torreyana Greene.
Verbena hastata L.
Pentstemon Richardsonii Dougl.
Lonicera utahensis Wat.
Iva axillaris Pursh.



FANNIN'S MOUNTAIN SHEEP. OVIS FANNINII (HORNADAY)
(Type Specimen.) Provincial Museum, Victoria, B. C.

Cleome serrulata Pursh.
Boisduvalia stricta (A. Gray) Greene.
Angelica Lyallii Wats.
Senecio Burkei Greenman.
Stephanomeria minor Nutt.

The following plants were returned to the Provincial Grazing Commission, Department of Lands:—

Calamagrostis inexpansa Gray.
Elymus Macounii Casey.
Fluminea festucacea (Willd.) Hitchc.
Carex prægracilis W. Boott.
Bassia hyssopifolium (Pall.) O. Kuntze.
Orthocarpus (*? purpurascens* Benth.)

Plants presented by Dr. C. F. Newcombe, collected by him at Bella Coola, B.C., and other stations:—

Bella Coola.

Phegopteris polypodioides Fée
Stellaria crispa C. & S.
Arabis ambigua DC.
Potentilla monspeliensis L.
Rubus strigosus Michx.
Glaux maritima L.

Lupinus littoralis Dougl. Channel Islands off Oak Bay, Victoria, V.I., extending its distribution south; previous station for Vancouver Island being Comox; Macoun.

Sanicula marilandica L. Collected at Kitwanga, Skeena River, B.C., establishing a northern distribution for the occurrence of the plant in British Columbia.

As this Department has no previous record of the following plants having been collected in British Columbia, they are printed as additions to the Flora of this Province:—

Myrica californica Cham. Tofino, V.I. 1922. Collected by Captain J. W. Thompson.

Bassia hyssopifolium (Pall.) O. Kuntze. Kamloops, B.C., September 19th. 1920. Collected by G. V. Copley.

Boisduvalia stricta (A. Gray) Greene. Near Douglas Lake, B.C., August 19th, 1921. Collected by G. V. Copley.

Pentstemon attenuatus Dougl. Fort Steele, B.C., June 23rd, 1922. Collected by W. B. Anderson.

Mertensia subcordata Greene. Takla Lake, B.C., September 25th, 1921. Collected by W. B. Anderson.

Arnica arcana A. Nels. Fort George, B.C., August 14th, 1917. Collected by W. B. Anderson.

Senecio Howellii Greene. Windermere, B.C., June 16th, 1922. Collected by W. B. Anderson.

The following plants are supplementary additions to "The Flora of Vancouver and Queen Charlotte Islands, 1921" (introduced plants being printed in italics in conformity with the printing of the Check-list):—

Equisetum pratense Ehrh. Mountains, V.I. (Macoun's "Catalogue of Plants.")

Lycopodium sabinæfolium Willd. Mount Arrowsmith, V.I.

Agrostis pallens foliosa (Trin.) Vasey. Vancouver Island, Macoun.

Polypogon Monspeliensis (L.) Desf. Victoria, V.I., Fletcher, Macoun.

Carex stipata Muhl. A common sedge along moist ditches, southern half of Vancouver Island.

Eriophorum Chamissonis albidum (Nyl.) Fernald. Vancouver Island. (Piper & Beattie's "Flora of the North-west Coast.")

Lazula Piperi Coville. Mount Arrowsmith, V.I.; previously listed as L. glabrata.

Allium attenuifolium Kellog. Maple Bay, Vancouver Island; (R. Glendenning) Alberni, Vancouver Island.

Myrica californica Cham. Near Tofino, west coast, Vancouver Island.

Papaver Rhoeas L. Vancouver Island, according to Britton & Brown.

Rhaphanus Rhaphanistrum L. Nanaimo, Vancouver Island, Macoun.

Mitella trifida Graham. Mount Arrowsmith, Vancouver Island.

Euphorbia Lathyrus L. Victoria. (Henry's "Flora of Southern B.C.")

Hydrocotyle umbellata L. Nanaimo, Vancouver Island, Macoun.

Datura Stramonium L. Saltspring Island (P. de Noe Walker), where it is becoming established in a wild state on old disused ground.

Hemizonella Durandi Gray. Vancouver Island. (Piper & Beattie's "Flora of the North-west Coast.")

Madia sativa capitata (Nutt.) Piper. Vancouver Island. (Piper & Beattie's "Flora of the North-west Coast.")

ORNITHOLOGY.

NOTES ON THE OCCURRENCE OF THE PLUMED EGRET (MESOPHOYX INTERMEDIA) IN BRITISH COLUMBIA, BY FRANCIS KERMODE.

In the year 1915 Mr. J. H. Fleming, of Toronto, visited the Museum and drew my attention to the snowy heron which we had labelled as *Egretta candidissima*, which had been secured by the late John Fannin at Burrard Inlet some years ago. Mr. Fleming kindly sent me in January, 1916, a skin of *Mesophoyx intermedia*, the Asiatic white heron, to compare with the one in this Department, as he was puzzled with regard to the exact species of our specimen.

Up to this time our specimen of this bird had always been acknowledged and looked upon as the American form *Egretta candidissima*, and, not having sufficient material for comparison, the matter had been left in abeyance for some time. However, in September, 1922, Mr. P. A. Taverner, the Dominion Government Ornithologist, visited the Museum and wished to see the specimen of snowy heron which had for so many years been rceognized as *Egretta candidissima*. He took descriptions, measurements, and made drawings of the same to compare with the specimens in the Victoria Memorial Museum, Ottawa. Mr. Fleming had loaned me a skin of *Mesophoyx intermedia*, and in comparing with our bird they seemed identical. On October 17th, 1922, Mr. Taverner wrote me from Ottawa, as follows:—

"Regarding the Egret: Whatever this bird is, it is not one of our American species. As far as I can see, it is identical with Fleming's specimen, but I am not well enough up on Asiatic species to identify it as such with confidence. It should be sent somewhere where they have an ample foreign collection, and probably the United States National Museum would be the best place. Have compared the drawings and measurements I made in Victoria and am only convinced that we have nothing like it in our collection. The only question remains is just what it is and whether the data attached can be absolutely depended upon. Do you think it can? I understand that Mr. Fannin was not at his best during his later years and that errors may have crept in.—P. A. TAVERNER."

Mr. Allan Brooks also had correspondence with me in regard to this bird during the year 1922, and so as to have the identification of the specimen settled, I sent it on to the Biological Survey Department at Washington, D.C., asking Mr. W. C. Henderson, Acting-Chief, to have Dr. C. H. Oberholser examine the specimen and compare it with specimens in the National Museum. The reply which I received from Mr. Henderson, Acting-Chief, Bureau of Biological Survey, is as follows (dated January 16th, 1923):—

"The three specimens that you sent some time ago for examination by Dr. Oberholser have been duly identified, and are being returned to you by express collect. The names you will find on the labels of the specimens. The heron turns out to be *Mesophoyx intermedia* in full breeding plumage. If the data on this bird are authentic and there is no reasonable doubt of its being the specimen originally taken on Burrard Inlet, it would prove to be an interesting addition to North American birds. We should be glad to have your opinion regarding this, as it is a matter of considerable interest in our work on the distribution of North American birds.—W. C. HENDERSON."

In regard to the dispute which seems to have arisen with reference to this bird being the specimen secured by the late John Fannin at Burrard Inlet, May 29th, 1879, I have looked up all records that I can find and have found a list in his own hand-writing by John Fannin of "Birds collected prior to 1886." In this list he records the little white heron, May 29th, 1879, Burrard Inlet. I have known this bird since September 25th, 1890, as it was in a case in the Museum when I first entered the Provincial Government service in this Department; and, furthermore, I have since looked up photographs taken by Mr. Albert H. Maynard, of this city, in the years 1890–91, and this specimen appears in the case. It has been suggested that probably the late Mr. Fannin had taken and duplicated the record of this bird with a skin purchased from a commission agent in this city years ago. This idea has been proved incorrect, as this bird had been recorded in the late John Fannin's "Check-lists of B.C. Birds," also in Montague Brown's "List of the Birds of Canada in 1887." In speaking to me about this bird years ago, Mr. Fannin always informed me that it had been shot at Burrard Inlet by an Indian. I have also endeavoured to get in touch with people who knew Mr. Fannin at Burrard Inlet since 1862, when he first arrived in British Columbia. Besides getting the information in the "Check-lists of the Birds prior to 1886," and the fact that Mr. A. H. Maynard told me he remembered this bird when he worked in the Department prior to my joining the service, I did not obtain any more information concerning it for some time.

However, on January 24th, 1922, Captain Oliver G. Harbell, an old personal friend of the late John Fannin, happened to call at my office, and knowing that he knew Mr. Fannin for many years, I asked him when they first became acquainted. Captain Harbell said that he arrived in Victoria on October 13th, 1875, from St. John, N.B., and after being here a few days he went over to Burrard Inlet and was living at Moodyville (opposite where the City of Vancouver is to-day), and about this time he made the acquaintance of Mr. Fannin. After a few more questions I asked him about the collection of birds Mr. Fannin had, and if he remembered what white birds were in the collection. He informed me that the only white bird he could remember was a white heron that had been killed by an Indian on the shores of Burrard Inlet in the latter part of May, 1879. He secured this bird from the Indian, and knowing that Mr. Fannin was desirous of obtaining all the specimens possible, he carried it over to Granville, on the southern side of Burrard Inlet (now the City of Vancouver), to Mr. Fannin, who mounted it and added it to his private collection.

The following is a copy of a letter that Captain Oliver G. Harbell has written me under his own signature, and I think this should settle, once and for all, any doubts concerning the occurrence of the plumed egret (*Mesophoyx intermedia*) as an accidental visitant in British Columbia, and not only is it an addition to the "List of British Columbia Birds," but also a record of an addition to the "Birds of North America":—

"Victoria, B.C., January 24th, 1923.

"*F. Kermode, Esq.,*
Director, Provincial Museum, Victoria, B.C.

"I, Oliver G. Harbell, of Victoria City, do hereby declare I am the person who secured the specimen of white heron (*Mesophoyx intermedia*) from an Indian at Burrard Inlet in the latter part of May, 1879. At the time I was living at Moodyville. The bird was freshly killed and I took it across the inlet to Granville and gave it to John Fannin, who skinned and mounted the specimen for his own private collection. This was prior to his becoming Curator of the Provincial Museum at Victoria, B.C.

"The late Mr. John Fannin, after being appointed Curator of the Provincial Museum at Victoria for the Provincial Government, moved all his private collection to Victoria, to form the nucleus of the Museum. The specimen in the Museum to-day is the same one that I gave the late John Fannin.

"(Signed) Oliver G. Harbell."

Notes on the Iceland Gull (Larus (leucopterus?)).

In the Annual Report for the year 1920 note was made of the capture of two specimens of the white-winged gull at Kildonan, on Barkley Sound, by William McKay. As some exceptions have been taken to the classification of these gulls, Mr. P. A. Taverner while here in September, 1922, examined these two specimens and made sketches for comparison with the birds in the Victoria Memorial Museum, Ottawa. Mr. Taverner wrote me from Ottawa on October 17th, 1922, as follows:—

"Your specimens are practically identical with two specimens we have from the Arctic Coast of Alaska that Dwight examined and pronounced *leucopterus*. However, he admits that his only distinction between *leucopterus* and *hyperboreus* is size, and these birds just come within the limits as laid down by him. He is assuming, therefore, that *hyperboreus* never gets smaller than his determined minimum and that anything smaller must of necessity be *leucopterus*. To admit anything else would make his position on the form *L. h. barrovianus*, on which he has stated himself very strongly, untenable.

"From my experience I do not think that ornithologists generally realize how great the size variation is in these large gulls. In the glaucous-winged especially the extremes are comparatively enormous, and considerably more than would account for the linking of these small and large *hyperboreus*. I see no reason for separating specifically these small white-winged gulls from the larger *hyperboreus*.—P. A. Taverner."

I sent these two birds to Mr. W. C. Henderson, Acting-Chief, Biological Survey, Washington, D.C., asking that Dr. C. H. Oberholser be given them for determination, who returned them labelled as *barrovianus*.

Upon looking up records, I find *barrovianus* is not now accepted by the A.O.U. and is not in their Check-list of 1910. Mr. Robert Ridgway, in his latest book on "Birds of North and Middle America," records the bird he describes as *L. barrovianus* in "The Auk," July, 1886, as a synonym of *L. hyperboreus*. He also lists the bird taken by Allan Brooks at Comox under *L. hyperboreus*, and has dropped *barrovianus*.

According to A. C. Bent, in the "Life Histories of North American Gulls and Terns," page 60: "Many years ago Mr. Ridgway (1886) described the glaucous gulls of the coasts of Alaska and adjacent waters as a new species under the name *Larus barrovianus*, the size and shape of the bill being the chief distinguishing character. Twenty years later Doctor Dwight (1906) argued that this species was untenable, and it was removed from the Check-list. Recently, however, Dr. H. C. Oberholser (1918) has resurrected *barrovianus*, as a subspecies of *hyperboreus*, on the claim that the Alaska bird is smaller and has a darker mantle than the birds from Greenland or from Europe. Whether this claim is well founded or not, it is apparently a fact that the characters he ascribes to the Alaska bird hold true in a large majority of the specimens, though there are some exceptions to the rule. Doctor Dwight, however, still maintains that the proposed race is unworthy of recognition in nomenclature."

Until some of these disputes are cleared up, as far as I can see this Department will have to recognize these birds as the Iceland gull (*Larus leucopterus*), as they do not come within the size of hyperboreas, and I cannot place them elsewhere.

NOTES ON THE OCCURRENCE OF THE WHITE PELICAN (PELECANUS ERYTHRORHYNCHOS).

Pelicans are not very commonly found in British Columbia, although two species occur. A fine specimen of the white pelican (*Pelecanus erythrorhynchos*) was secured by Mr. Jack Bessonette at Macaulay Point, Rod Hill, Victoria, and presented to the Museum on October 10th, 1922.

A number of these white pelicans have been taken at different times in the Interior of the Province, but not many on the Coast, although we have had a specimen from Comox. The farthest northern record I have on the Coast is the specimen in the Museum taken at Port Essington, on the Skeena River.

NOTES ON THE OCCURRENCE OF THE BROWN PELICAN (PELECANUS CALIFORNICUS).

Several California brown pelicans (*Pelecanus californicus*) have been taken in this Province; two specimens in the vicinity of Victoria, one near Race Rocks, the other in Esquimalt Harbour, and both these specimens are now in the Provincial Museum. The farthest northern record of this bird in British Columbia was recorded at Burrard Inlet by the late John Fannin.

ENTOMOLOGY.

BY E. H. BLACKMORE, F.E.S.

The past season has been the most remarkable one from a weather standpoint that we have had for over thirty years. With the exception of a few showery days, we practically had no rain from April to August, the actual precipitation for the five months being 1.91 inches, most of this being in the beginning of April and the end of August.

The sunshine for the year showed 134 hours above the average annual amount. During the five months, April to August, there were 1,425 hours of sunshine, giving an average of 9⅓ hours daily. The above figures are for Victoria and vicinity only, although similar conditions prevailed throughout the Province, varying according to the locality.

It is hard to determine exactly what effect this abnormally dry weather had on insect-life in general, but the one fact which stood out most clearly was the remarkable scarcity of noctuid moths throughout the whole season. Reports from many points in Southern British Columbia showed the same state of affairs. In the early spring insects of all kinds were very scarce, but as the season wore on geometers and micros were more plentiful, although many species which are usually common were apparently scarce.

A much greater interest has been shown in entomology during the past two years, especially among the younger collectors, and the Museum collections are in frequent demand for the purposes of identification.

ACKNOWLEDGMENTS.

We wish to thank the following specialists for their kindness in determining material submitted to them during the past season: Dr. W. Barnes, Foster H. Benjamin, August Busck, Carl Heinrich, Dr. J. McDunnough, W. Schaus, and L. W. Swett.

BRITISH COLUMBIA INSECTS NEW TO SCIENCE.

The following forty-six insects from British Columbia have been described as new to science since last year's Museum Report was written. They include fifteen species of Lepidoptera, four species of Coleoptera, three species of Hymenoptera, twenty-three species of Diptera, and one species of Hemiptera.

LEPIDOPTERA.

The fifteen species of Lepidoptera are distributed amongst the various families as follows: Noctuidæ, 2; Notodontidæ, 1; Geometridæ, 6; Œcophoridæ, 1; Eucosmidæ, 1; Tortricidæ, 1; Glyphipterygidæ, 1; Yponomeutidæ, 1; and Cygnodoidea, 1.

Noctuidæ (Cuculliinæ).

Oncocnemis youngi McDunnough. Described (Can. Ent., Vol. 54, page 236, Oct., 1922) from a single female specimen taken by Mr. C. H. Young at the Biological Station, Departure Bay, B.C.

Oncocnemis columbia McDunnough. Described (Can. Ent., Vol. 54, page 237, Oct., 1922) from a single male specimen taken by Dr. W. R. Buckell at Salmon Arm, B.C.

Notodontidæ.

Cerura occidentalis gigans McDunnough. Described (Can. Ent., Vol. 54, page 139, June, 1922) from specimens taken at Pine Creek, near Calgary, Alta., by the late F. H. Wolley Dod. A single specimen from Kaslo, B.C., is also apparently included in the paratypes. I have two specimens from Rossland, B.C., and one from Trail, B.C., taken by the late W. H. Danby, which agree perfectly with Dr. McDunnough's description of *gigans*. They were labelled in my collection as *occidentalis* Lint. I have two others also from Rossland which I cannot separate from Victoria specimens of *scolopendrina* Bdv.

Geometridæ.

Eupithecia stikineata Cassino & Swett. Described (The Lepidopterist, Vol. 3, Nos. 6–7, page 146, Feb., 1922) from two males and two females taken by Mr. Theodore Bryant at Stikine River, B.C., in June, 1905. This species belongs to the *vancouverata-græfi* group, but is quite distinct from the former. It differs from *vancouverata* in the more pointed wings, in its lighter coloration, and in the general arrangement of the transverse lines; *græfi* I do not know.

Eupithecia cenataria Cassino & Swett. Described (The Lepidopterist, Vol. 3, Nos. 6–7, page 147, Feb., 1922) from a series of rather worn specimens taken by the writer at Goldstream, B.C., on September 5th–7th, 1920.

Eupithecia scabrogata form *gilvipennata* Cassino & Swett. Described (The Lepidopterist, Vol. 3, Nos. 6–7, page 147, February, 1922) from a single male specimen taken by Mr. Theodore Bryant at Wellington, B.C., on May 9th, 1902.

Xanthorhöe incursata race *harveyata* Cassino & Swett. Described (The Lepidopterist, Vol. 3, No. 8, page 157, March, 1922) from specimens taken by the late Captain R. V. Harvey at Vancouver in July, 1904.

Xanthorhöe aquilonaria Cassino & Swett. Described (The Lepidopterist, Vol. 3, No. 8, page 158, March, 1922) from specimens taken by E. M. Anderson at Atlin, B.C., in June, 1914.

Xanthorhöe ramaria race *delectaria* Cassino & Swett. Described (The Lepidopterist, Vol. 3, No. 9, page 159, April, 1922) from specimens taken at Atlin, B.C., by E. M. Anderson in June, 1914. Further notes on these new species of Geometridæ will be found under the heading of "Illustrated Lepidoptera" and figures of the same are illustrated on Plate VI.

Œcophoridæ.

Agonopteryx blackmori Busck. Described (Can. Ent., Vol. 53, page 277, Dec., 1921) from specimens bred by the writer at Victoria in June, 1918. A figure of one of the co-types will be found on Plate VI., and further remarks on the species under "Illustrated Lepidoptera."

Eucosmidæ.

Argyroploce buckellana McDunnough. Described (Can. Ent., Vol. 54, page 43, Feb., 1922) from a single male specimen taken by Dr. W. R. Buckell at Salmon Arm on May 28th. This species belongs to the *capreana-nimbatana* group of this genus.

Tortricidæ.

Cacœcia victoriana Busck. Described (Can. Ent., Vol. 53, page 278, Dec. 1921) from three specimens taken by the writer at Victoria and Goldstream, B.C. A note on this species will be found under "Illustrated Lepidoptera," together with a figure of the species on Plate VI.

Glyphipterygidæ.

Hilarographa youngiella Busck. Described (Can. Ent., Vol., 53, page 278, Dec., 1921) from two specimens, one taken by Mr. C. H. Young at Departure Bay, B.C., and the other by Mr. W. Downes at Victoria, B.C. During the present season Mr. W. R. Carter took a small series of this new species at Esquimalt, near Victoria, on August 7th–10th, and Mr. L. E. Marmont also took a few specimens at Maillardville in July. This species is interesting from the fact that it is the first record of the genus *Hilarographa* from North America. It is very similar in appearance to *Laspeyresia vancouverana* Kearf. (Eucosmidæ), but the venation of the wings and the antennal structure at once separate it from that family.

Yponomeutidæ.

Argyresthia monochromella Busck. Described (Can. Ent., Vol. 53, page 279, Dec., 1921) from four specimens taken by the writer at Victoria on April 20th–22nd, 1921.

Cygnodoidea.

Apheloscetia cygnodiella Busck. Described (Can. Ent., Vol. 53, page 280, Dec. 1921) from specimens taken by Mr. W. Downes at Victoria, B.C., on April 26th, 1920.

COLEOPTERA.

Cicindelidæ.

Cicindela wallisi Calder. Described (Can. Ent., Vol. 54, page 62, March, 1922) from two specimens taken by Mr. J. B. Wallis at Penticton, B.C., on August 13th, 1909. This new species was originally described under the name of *azurea*, but owing to this name being preoccupied it was changed (*ibidem* page 191, Aug., 1922) to *wallisi.*

Carabidæ.

Elaphus clairvillei form *frosti* Hippisley. Described (Can. Ent., Vol. 54, page 63, March, 1922) apparently from a single specimen taken by Mrs. W. W. Hippisley at Terrace, B.C.

Buprestidæ.

Pœcilonota fraseri Chamberlin. Described (Journ. N.Y. Ent. Soc., Vol. 30, page 64, March, 1922) from two male specimens, one of which was taken by a Mr. Weldt on the Fraser River, B.C., but without date or exact locality. The other specimen was taken on June 5th, 1909, but bears no locality label other than "Canada" and was received by the author through Dr. J. Swaine.

Cerambycidæ.

Leptura aspera form *parkeri* Hippisley. Described (Can. Ent., Vol. 54. page 66, March, 1922) from Terrace, B.C. Probably described from a single specimen taken presumably by the author, but neither date of capture, number of specimens, nor collector's name is given.

HYMENOPTERA.

Ichneumonidæ (Pimplinæ).

Phytodictus fumiferanæ Rohwer. Described (Can. Ent., Vol. 54, page 155, July, 1922) from one male and two females bred by Mr. A. B. Baird at Lillooet, B.C. This is a new parasite of the spruce-bud worm (*Harmologa fumiferana*) and was reared from cocoons collected by Mr. Baird on July 11th, 1919.

Braconidæ (Microgasterinæ).

Apanteles caudatus Muesbeck. Described (Pro. U.S. Nat. Mus., Vol. 61, page 16, 1922) from eight specimens, three of which are from the type locality, Carbonate, B.C. These specimens were collected by Dr. J. C. Bradley on July 7th–12th, 1908, at an altitude of 2,600 feet. The other specimens are from Cheyenne, Wyoming (1); Mica, Washington (3); and Yellowstone Lake, Montana (1).

Apanteles olenidis Muesbeck. Described (Pro. U.S. Nat. Mus., Vol. 61, page 18, 1922) from nine male and fourteen female specimens bred from *Olene vagans* B. & McD. by Mr. E. P. Venables at Vernon, B.C. All the species of the genus *Apanteles* are parasitic on the larvæ of butterflies and moths and cover the infested caterpillar with their oval white cocoons.

DIPTERA.

Tipulidæ.

Alexandriaria (gen. nov.) *suffusca* Garrett. Described (Pro. Ent. Soc., Wash., Vol. 24, page 60, Feb., 1922) from one male and one female specimen taken by Mr. C. B. Garrett at Cranbrook, B.C., on October 9th, 1920.

Alexandriaria intermedia Garrett. Described (Pro. Ent. Soc., Wash., Vol. 24, page 60, Feb., 1922) from two males and one female taken at Cranbrook, B.C., by Mr. Garrett in July, 1920.

Alexandriaria kooteniensis Garrett. Described (Pro. Ent. Soc., Wash., Vol. 24, page 61, Feb., 1922) from a single male taken by Mr. Garrett at Cranbrook on July 15th, 1920.

Chionea alexandriana Garrett. Described (Pro. Ent. Soc., Wash., Vol. 24, page 62, Feb., 1922) from one male and five female specimens. Five of the specimens were taken by Mr. Garrett at Cranbrook, B.C., in February, 1920 and 1921. The other was taken by a trapper on the hills near Canal Flats, Kootenay Valley.

Blepharoceridæ.

Bibiocephala canadensis Garrett. Described (Ins. Ins. Mens., Vol. 10, page 89, April–June, 1922) from fifteen specimens taken at Wilson Creek near Michel, B.C., at an altitude of 5,000 feet, by Mr. Garrett in August and September.

Bibiocephala kellogi Garrett. Described (Ins. Ins. Mens., Vol. 10, page 91, April–June, 1922) from a single specimen taken by Mr. Garrett at Cranbrook, B.C., on July 13th, 1921.

Tabanidæ.

Tabanus laniferus McDunnough. Described (Can. Ent., Vol. 54, page 239, Oct., 1922) from thirteen specimens taken at Banff, Alta., and various points in British Columbia. The type locality is Banff and the British Columbia localities are Hector, Mount Cheam, and Lillooet.

Syrphidæ.

Melanostoma squamulæ Curran. Described (Can. Ent., Vol. 53, page 275, Dec., 1921) from five specimens taken at Victoria, B.C., in April and May. The collector's name is not given.

Toxomerus occidentalis Curran. Described (Can. Ent., Vol. 53, page 258, Nov., 1921) from forty-two specimens taken in California, Oregon, and British Columbia. The holotype male was taken by Mr. W. Downes at Victoria, B.C., on May 5th, 1919.

Cynorhina robusta Curran. Described (Can. Ent., Vol. 54, page 14, Jan., 1922) from a single female from British Columbia. No further data are given.

Cynorhinella (gen. nov.) *canadensis* Curran. Described (Can. Ent., Vol. 54, page 15, Jan., 1922) from a single male taken by the Rev. J. H. Keen at Inverness, B.C., in July, 1910.

Mallota columbiæ Curran. Described (Can. Ent., Vol. 54, page 16, Jan., 1922) from a single female taken by Mr. R. C. Treherne at Penticton, B.C., on June 5th, 1919.

Brachypalpus apicaudus Curran. Described (Can. Ent., Vol. 54, page 119, May, 1922) from a single male specimen taken by Mr. C. B. Garrett at Cranbrook, B.C.

Tachinidæ.

Lydella hyphantriæ Tothill. Described (Technical Bulletin No. 3, page 43, Dept. Agriculture, Ottawa, 1922) from four specimens bred at Agassiz, B.C.

It is a grey fly with clear wings and is a new parasite on the fall web-worm (*Hyphantria cunea* Drury). It may not be out of place to make a few remarks on this particular bulletin of the Dominion Department of Agriculture, as it is an exceedingly valuable contribution to our economic literature.

The Bulletin is entitled "The Natural Control of the Fall Web-worm in Canada, together with an Account of its Several Parasites." It comprises 107 pages, with many text illustrations. In addition, there are six beautiful plates containing figures of the various adult parasites with their cocoons, and also several other plates showing the anatomical structure of the larvæ.

The work is written by Dr. John D. Tothill and is the result of eight years' intensive study, in which he was ably assisted by Mr. A. B. Baird. The control-work was carried on in three different Provinces—in New Brunswick from 1912 to 1918, in Nova Scotia from 1916 to 1918, and in Southern British Columbia from 1917 to 1919.

Ernestia frontalis Tothill. Described from two males, one taken by Mr. Harrington at Yukon River, Alaska, and the other by Mr. C. B. Garrett at Cranbrook, B.C.

Ernestia johnsoni Tuthill. Described from four males, three from Massachusetts and one from Fry Creek, B.C. Dates of capture and collectors' names not given.

Ernestia nigropalpis Tothill. Described from eleven males takes at Stikine River, B.C. (type locality) (Mr. Wickham); Savary Island, B.C. (R. S. Sherman); and Franconia, N.H. (C. H. Townsend).

Ernestia platycarina Tothill. Described from ten males taken at Savary Island, B.C. (R. S. Sherman); Bear Lake, B.C. (A. N. Caudell); Franconia, N.H. (C. H. Townsend); and Virginia.

Ernestia sulcocarina Tothill. Described from ten males taken at Cranbrook, B.C. (C. B. Garrett); Lillooet, B.C. (A. B. Baird); and Husavick, Man. (J. B. Wallis).

Ernestia bicarina Tothill. Described from four males taken at Bear Lake, B.C.; Boseman, Mon.; and Tennessee Pass, Colo.

The above six species were described by Dr. Tothill in his "Revision of the Nearctic species of the genus *Ernestia*," which appeared in the Canadian Entomologist (Sept., Oct., Nov., and Dec., 1921).

Helomyzidæ.

Leria serrata form *nigricana* Garrett. Described (Ins. Ins. Mens., Vol. 10, page 176, Oct.–Dec., 1922) from a single female taken by Mr. C. B. Garrett at Cranbrook on June 4th, 1921.

Leria serrata form *vinus* Garrett. Described (Ins. Ins. Mens., Vol. 10, page 177, Oct.–Dec., 1922) from seven specimens taken by Mr. Garrett at Cranbrook and Michel.

Ephydridæ.

Trimerina adfinis Cresson. Described (Ent. News, Vol. 33, page 137, May, 1922) from a single female taken at Kaslo, B.C., by Mr. R. P. Currie.

HEMIPTERA (HETEROPTERA).

Miridæ.

Labops hirtus Knight. Described (Can. Ent., Vol. 54, page 258, Nov., 1922) from a large number of specimens taken in a wide range of localities throughout Canada and the United States, including three specimens from Chilcotin, B.C., captured by Mr. E. R. Buckell on July 28th, 1920.

Labops tumidifrons Knight. Described (Can. Ent., Vol. 54, page 259, Nov., 1922) from five specimens taken by Mr. R. C. Treherne at Chilcotin, B.C., on June 15th, 1920.

LEPIDOPTERA NOT PREVIOUSLY RECORDED FROM BRITISH COLUMBIA.

The following thirteen species are new records for the Province and were all taken by Dr. W. R. Buckell, of Salmon Arm, B.C., who has added considerably to our knowledge of British Columbia Lepidoptera by his persistent and careful collecting during the past few years. In a few days' vacation, spent with his nephew, Mr. E. R. Buckell, at Nicola Lake, he was successful in securing at least four new records. There are in his collection other apparently new species, but these have not as yet been definitely determined.

Noctuidæ.

1072. *Melicleptria perminuta* Hy. Edw. One specimen taken at Nicola Lake, B.C., June 18th, 1922. This is a good record and is very rare in collections. It was described by Hy. Edwards in 1881 from specimens taken in the Sierra Nevadas, Cal.

1275. *Euxoa infracta* Morr. Taken at Salmon Arm, B.C. Described in 1875 from Colorado and Texas.

1659. *Polia detracta* Wlk. Two specimens taken at Salmon Arm, one on July 9th, 1921, and the other on June 28th, 1922. This is the first authentic record of *detracta* that we have had. The specimens listed from Kaslo under that name are not typical *detracta*, but are nearer to the form *neoterica* Sm., the colours being darker and less diversified, although the insect is as large as *detracta*. *Neoterica* from Alberta and Saskatchewan is smaller. I have listed the Kaslo specimens under the latter name.

1665. *Polia purpurissata* Grt. Taken at Salmon Arm. We are glad to have this record, as although it was listed in the 1906 Check-list it was very doubtful if the typical form occurred in the Province. The specimen recorded as such from Atlin, B.C., was in the Bryant collection, and it is undoubtedly the form *crydina* described (Pro. U.S.N.M., Vol. 27, page 840, 1904) by Dyar from Kaslo, B.C. Our lists should now read:—

Polia purpurissata Grt. Salmon Arm.
Polia purpurissata form *juncimacula* Sm. Rossland.
Polia purpurissata form *crydina* Dyar. Kaslo, Atlin, Salmon Arm, and Vancouver Island.

The three forms are very close to each other, and although the difference can scarcely be put into words they are somewhat easily separated by their general habitus.

* *Polia subjuncta* race *eleanora* B. & McD. A single specimen taken at Nicola Lake on June 18th, 1922. This is another very interesting record, as it was described (Cont. Lep. No. Amer., Vol. 4, No. 2, page 95, May, 1918) from eight specimens taken at Nellie, Palomar Mountain, Southern California. It differs from typical *subjuncta* in the generally lighter and greyer colour and the almost entire absence of the carneous shades. The typical form has a very wide distribution, ranging from the Atlantic States to British Columbia and then south to California.

1708. *Polia meodana* Sm. One specimen taken at Nicola Lake on June 17th, 1922. This is very close to *liquida* Grt., but lacks the latter's bright colours and is a rather dull-looking insect. Dr. McDunnough thinks that it is probably only a form of *liquida*.

1941b. *Cirphis insueta* race *dia* Grt. Taken at Nicola Lake on June 18th, 1922. This is very close to our common Vancouver Island form *heterodoxa* Sm. They are both races of the Eastern *insueta*. *Dia* was described as a good species from California.

2160. *Graptolitha tepida* Grt. Several specimens taken at Salmon Arm. It flies at the end of September and is an inhabitant of the Atlantic States.

2215, 1. *Conistra fringata* B. & McD. Taken at Salmon Arm on October 9th, 1921. Further remarks on this species will be found under the heading of "Illustrated Lepidoptera."

2223. *Parastictis decipiens* Grt. Three specimens taken at Salmon Arm. The type is in the British Museum and was described by Grote in 1881 from specimens taken in Northern Indiana.

3187. *Zale benesignata* Harv. Taken at Salmon Arm on May 24th, 1921. (*See* "Illustrated Lepidoptera.")

**Autographa interalia* Ottolengui. Taken at Salmon Arm. This is an interesting record as the species has only been described comparatively recently (Jour. N.Y. Ent. Soc., Vol. 27, page 123, June–Sept., 1919). It was described from two females taken by Mr. K. Bowman at Nordegg, Alta. A very-much-worn male specimen was also taken by Dr. Ottolengui at Banff, Alta. It is probably only a Western race of *alias* Ottol., the latter being a common species throughout the Atlantic States.

Geometridæ.

3802. *Synchlora rubrifrontaria* Pack. One specimen taken at Salmon Arm. This record brings our list of species in the subfamily Hemithinæ up to seven. It is the prettiest of our "greens," the white transverse lines being distinctly scalloped or wavy. The species was described by Packard in 1873 from four specimens taken in New York State and Central Missouri.

Rare and Uncommon Lepidoptera taken in British Columbia during 1922.

Victoria.—It has been the worst year for Macrolepidoptera that I have known in my twelve years' collecting here. Scarcely anything of note has been captured in this vicinity. A specimen of *Annaphila decia* Grt. was taken by Master Lewis Clarke, and the writer took a specimen of *Hydriomena renunciata columbiata* Taylor on April 30th. This is not by any means a common species, as only occasional specimens are taken. I also captured a nice series of *Cosymbria dataria* Hulst. on Mount Tolmie in May.

Saanichton.—This year we have the pleasure in welcoming to our ranks two enthusiastic collectors in the persons of the Hon. J. G. Colville and Captain J. Wise. Commencing in April, these two gentlemen, with the assistance of the Hon. A. Colville, collected continuously every suitable evening until the middle of October. Their combined efforts have resulted in forming the nucleus of a fine collection. The majority of their captures were made at "light" and included a number of very desirable species, the most interesting of which are as follows: *Euxoa divergens abar* Streck. A single specimen taken on June 6th. This is a most interesting capture, as our only previous record of this form is a couple of specimens taken at Duncan many years ago by the late E. M. Skinner; *Aplectoides occidens* Hamps. (*see* "Illustrated Lepidoptera"); *Acronycta illita* Sm.; *Arzama obliqua* Wlk.; a fine female specimen of this uncommon species was taken on July 5th; *Autographa speciosa* Ottol. Amongst the Geometridæ the best captures are *Lygris atrifasciata* Hulst; *Dysstroma sobria ochrofuscaria* Swett; several specimens were taken in June. It is rather an uncommon species, as with the exception of a worn specimen taken in 1920, these are the first records that I have had since it was described in 1917 (Can. Ent., Vol. 49, page 70). *Dysstroma walkerata* Pears; this is one of the rarest of our species in this genus. Mr. Cockle has taken it at Kaslo and I have a single specimen taken on Mount Arrowsmith, Vancouver Island. *Caripeta æquliaria* Grt.; *Cleora latipennis* Hulst.; and a single male specimen of *Sabulodes cervinaria* Pack.

Duncan.—In this district noctuids have been scarce, but geometers have been fairly abundant, although they were mostly of the common kinds.

Mr. G. O. Day took three fine specimens of *Dysstroma ethela* Hulst. in July. A figure of this beautiful species was given in Report, Prov. Mus., 1921, Plate IV. Mr. A. W. Hanham's best captures were *Heliothis phloxiphaga* G. & R. (rare on Vancouver Island, but taken more frequently in the Interior); *Agrotis havilæ* Grt. (very rare); *Polia sutrina* Grt. (rare), the first specimen taken here for many years; *Polia pulverulenta* Sm. (uncommon); *Autographa brassicæ* Riley; two specimens taken on flower-blossoms on August 25th. Although this species is common throughout the continent, it is rare in British Columbia. Mr. Hanham's capture is the first record from Vancouver Island, and I believe Mr. Cockle, of Kaslo, has also taken one or two specimens.

Maillardville.—Mr. L. E. Marmont reports a very poor season on the whole, although he has taken a few very good things, chief amongst them being a single specimen of that very rare arctid *Acmilia roseata* Wlk. (*see* "Illustrated Lepidoptera"). *Papaipema insulidens* Bird; this is the first record from the Mainland (*see* "Illustrated Lepidoptera"); *Eremobia claudens albertina* Hamp.; *Autographa metallica* Grt. (first record from this district). Amongst the Geometridæ were *Cleora albescens* Hulst. (two fine specimens); *Gabriola dyari* Taylor; and two specimens of *Plagodis approximaria* Dyar; this is rather a rare species and has only previously been recorded from Duncan, Kaslo, and Trail, but this year we have had it recorded from Agassiz and Vavenby as well. While spending a week with Mr. Marmont in June, the writer was successful in capturing a specimen of *Euthyatira semicircularis* Grt. (*see* "Illustrated Lepidoptera"), a fine specimen of *Eustroma nubilata macdunnoughi* Blackm., and a specimen in good condition of *Euphyia luctuata obductata* Moesch, the first that I have ever taken.

Nicola Lake.—During the past season Mr. E. R. Buckell, Assistant Entomologist of the Provincial Department of Agriculture, has been stationed in this locality investigating the grasshopper situation. In addition to his regular duties he has made a small collection of Lepidoptera, some of which are of more than ordinary interest. *Euxoa murdocki* Sm.; this rather handsome noctuid is exceedingly rare in British Columbia; in fact, the only other record of it that I have is a specimen taken some years ago by Mr. A. W. Phair at Lillooet. Dr. J. B. Smith (Bull. 44, U.S.N.M., Cat. Noctuidæ, 1893) gives Utah, North-west British Columbia, Oregon, and Colorado as localities for *murdocki*, but it is almost certain that his North-west British Columbia relates to Alberta. *Oncocemis umbrifascia* Sm.; this rather delicate species is also very rare. It is the third specimen that I have had recorded from the Province, the first being taken by Mr. Phair at Lillooet, and the second by Mr. W. B. Anderson at Fort Steele. *Xylena thoracia* Put-Cram; *Trachea inordinata montana* Sm.; a single specimen taken on June 13th. Our previous records are Chilcotin (E. R. Buckell) and Vernon (M. Ruhmann). *Gortyna obliqua* Harv.; a single specimen of this rather rare species was taken on August 29th. I have seen single specimens from Duncan (A. W. Hanham), Kaslo (J. W. Cockle), and Armstrong (W. Downes).

Marron Lake.—This locality is situated about 12 miles south-east of Penticton, and would doubtless yield rich returns if persistent collecting were carried on throughout the whole season. Mr. C. de Blois Green, who is now resident in this district, collected a little material in July. Amongst his captures were *Lampra placida* Grt., a beautiful red specimen, unlike any other that I have seen, but undoubtedly referable to this species, which is at present in a state of evolution; *Polia illaudabilis restora* Sm.; *Caradrina extima* Wlk.; and *Sarrothripus revayana cinereana* N. & D. In the Geometridæ, *Acidalia ancellata* Hlst. and *Itame plumosata* B. & McD. were the best.

Vavenby.—Mr. T. A. Moilliet and his son Ted again collected a very large amount of material in this locality. Although a great deal of it was a duplication of species taken the year before, nevertheless a very fair percentage represented species not previously recorded from this district. We have one or two species not yet definitely determined, which may eventually turn out to be new to the Province. The following is a list of the most desirable species taken:—

Amongst the diurnals was a specimen of *Eurymus nastes streckeri* Grt. taken at an altitude of 6,000 feet; *Oeneis macouni* Edw., taken on June 5th; this is a very good record, as it is apparently a very rare species in British Columbia. I have only seen one other authentic specimen and that was taken at Armstrong (W. Downes), although I have a record of a specimen being taken at Enderby (J. Wynne), which is in the same general locality. *Hesperia centaureæ* Ramb.; two specimens of this rare skipper were taken on July 14th at an altitude of 6,000 feet, one of them being in beautiful condition. The only previous records for the Province are a single specimen captured at Atlin (E. M. Anderson) in 1914 and one or two specimens taken by the late Wolley Dod at Windermere. Owing to the poorness of the season the noctuids did not make as good a showing as last year. A short series of *Polia negussa* Sm. was taken, our previous records of this species being from Rossland and Vernon; *Polia segregata* Sm., a single specimen; it is quite possible that *negussa*, *segregata*, together with *gussata* Sm., are only varietal forms of the same species. Three specimens of *Perigrapha algula* Sm. and one *P. achsha* Dyar were taken. We are glad to get these as there has been some confusion in the determination of these rather uncommon species. A figure of each is given on Plate V. and further remarks will be found under "Illustrated Lepidoptera." In the Notodontidæ a single specimen each of *Gluphisia septentrionalis* Wlk. and *G. septentrionalis quinquelinea* Dyar was taken. These are both good records and are figured on Plate V., with additional remarks under "Illustrated Lepidoptera." Three specimens of *Gluphisia severa danbyi* Neum were taken between April 20th and 26th. Amongst the Geometridæ the following are worthy of note: *Itame epigenata* B. & McD., an uncommon species and previously recorded from Kaslo (Cockle) and Mount McLean (Day & Hanham). A figure of this species was given in the Report, Prov. Mus., 1920, Plate I. *Itame denticulodes* Hulst. (*see* "Illustrated Lepidoptera"); *Spodolepsis substriatana danbyi* Hulst.; a long series of this species was taken in the last week of April. It shows a very wide range of variation; in some specimens the transverse markings and median band stand out in striking contrast, while in others they are nearly obsolete and give the insect a nearly unicolorous appearance. *Lycia ursaria* Wlk.; a single specimen of this uncommon species was taken on April 25th. Mr. Cockle has taken it at Kaslo and our only other record is a specimen taken by the late W. H. Danby at Rossland in 1900. An illustration of this species was given in Report, Prov. Mus., 1918, Plate II. *Plagodis approximaria* Dyar; a good record and extends our knowledge of the distribution of this rather rare species in the Province. *Erannis vancouverensis* Hulst.; a single rather worn specimen taken in November. A rather unexpected record, as, with the exception of a few odd specimens taken at Kaslo, I have no record of its appearance outside of Vancouver Island and the Lower Fraser Valley.

Kaslo.—Mr. Cockle reports a very poor season and very little of anything has been taken. His best capture was a specimen of *Autographa bimaculata* Steph.; this species is rare in the Province and is the first record from this district. I have a specimen labelled Victoria, B.C., 1890, but cannot vouch for the authenticity of the label, and I have seen a specimen taken by Mr. W. B. Anderson at Fort Steele. These are all the records of this species that I have any knowledge of. Mr. Cockle also took specimens of *Euxoa catenula* Grt. and *Euxoa comosa* Morr. Kaslo is the only British Columbia locality from which the latter species has been recorded.

Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, also reports the worst collecting season in his experience. His duties take him to many different parts of the Province, and as he is a very keen naturalist his material always contains something worthy of note. The following are his most interesting captures:—

Agassiz.—Plagodis approximaria Dyar.; a single specimen taken on July 23rd. This is a very late date for this species, as our specimens from other localities were all taken in May.

Fort Steele.—Macaria unipunctaria Wright; *Phasiane orillata* Wlk.; and a single specimen of *Marmopteryx marmorata* Pack.; this is an unexpected locality for this species, as all our previous specimens have been taken between Penticton and Osoyoos.

Keremeos.—Euxoa cinereopallida Sm.; two specimens taken on September 16th. Our previous records are from Lillooet (A. W. Phair) and Penticton (W. B. Anderson). *Euxoa quadridentata flutea* Sm.; a single specimen taken on the same date. This capture extends the known range of this species in the Province, as we have only had it listed previously from Chilcotin (E. R. Buckell) and Fort Steele (W. B. Anderson).

Lytton.—Oncocnemis cibalis Grt. A rather worn specimen of this uncommon species was taken on September 24th.

MICROLEPIDOPTERA.

Although it has been such a poor season for Lepidoptera in general, we have been successful in getting together a large number of micros, of which I have set up something over 1,400 specimens. Many of these have not been previously recorded from this Province, a few are new to science, and our collections have been enriched by many desirable species which were previously unrepresented.

We are very much indebted to the Hon. J. G. Colville and to Captain J. Wise, who made large collections during the season at the beautiful home of the former, which is ideally situated on the Saanich Arm, some 16 miles north of Victoria. They collected persistently throughout the whole of the season and brought in hundreds of specimens, including many desirable species and several new records for the Province. Collections have also been made at Victoria, Fitzgerald, Duncan, Maillardville, Nicola Lake, Salmon Arm, Marron Lake, and Vavenby.

The following list of species are new to the Province and are additional to those previously published in the Annual Reports of the Provincial Museum for 1920 and 1921 .

The greater part of this season's captures in the *Tineina* (*sens lat.*) have not yet been worked up and anything new or worthy of note will be included in next year's report.

The numbers and arrangement are in accord with Messrs. Barnes & McDunnough's Check-list. Those marked with a star have been described since the "List" was published.

Collectors: W. B. Anderson, E. H. Blackmore, E. R. Buckell, W. R. Buckell, W. R. Carter, Hon. J. G. Colville, C. deB. Green, A. W. Hanham, L. E. Marmont, T. A. Moilliet, A. W. Phair, and Captain J. Wise. The initials only are used in the following records.

Pyralidæ (Phycitinæ).

5562. *Dioryctia auranticella* Grt. Lillooet (A. W. P.).
5600. *Nephopteryx hypochalciella* Rag. Goldstream (E. H. B.).
5613B. *Salebria virgatella inconditella* Rag. Duncan (A. W. H.).
5662. *Pyla æneoviridella* Rag. Mount McLean (A. W. H.).
    * *Pyla sylphiella* Dyar. Mount McLean (A. W. H.).
5676. *Megasis edwardsialis* Hlst. Chilcotin (E. R. B.).
5680. *Megasis atrella* Hlst. Chilcotin (E. R. B.).
5719. *Euzophera aglæella* Rag. Duncan (A. W. H.).
5749. *Honora montinatatella* Hlst. Duncan (A. W. H.).

Cosmopterygidæ.

6969, 1. *Chrysoclista villella* Busck. Maillardville (E. H. B.; L. E. M.).
6008. *Mompha eloisella* Clem. Ladysmith (T. Bryant).
6018. *Mompha unifasciella* Cham. Maillardville (L. E. M.).

Gelechiidæ.

6069. *Chrysopora hermannella* Fabr. Vernon (E. P. Venables).
    * *Telphusa agrifolia* Braun. Victoria (E. H. B.).
6278. *Gelechia mediofuscella* Clem. Victoria (E. H. B.).
6283. *Gelechia conclusella* Wlk. Vavenby (T. A. M.).

6290. *Gelechia fuscotæniaella* Cham. Maillardville (L. E. M.).
6293. *Gelechia alternatella* Kearf. Duncan (A. W. H.); Vavenby (T. A. M.).

Œcophoridæ.

6414. *Eumeyrickia trimaculella* Fitch. Vavenby (T. A. M.).
* *Agonopteryx blackmori* Busck. Victoria (E. H. B.; W. R. C.); Saanichton (J. G. C.).

Ethmiidæ.

6622. *Ethmia albistrigella* Wlshm. Lillooet (A. W. P.).
6624. *Ethmia monticola* Wlshm. Chase (W. B. A.).

Ægeriidæ.

6654. *Ægeria tibialis* Harris. Marron Lake. (C. B. G.).

Eucosmidæ.

6816. *Argryoploce albeolana* Zell. Vavenby (T. A. M.).
6827. *Argyroploce hebesana* Wlk. Saanichton (J. G. C.).
6838. *Argyroploce coronana* Kearf. Salmon Arm (W. R. B.).
6844. *Argyroploce puncticostana* Wlk. Adams Lake (W. B. A.); Vavenby (T. A. M.).
6861. *Argyroploce nubilana* Clem. Saanichton (J. W.); Agassiz (W. B. A.).
6865. *Argyroploce fuscalbana* Zell. Vavenby (T. A. M.).
* *Argyroploce buckellana* McD. Salmon Arm (W. R. B.).
6949. *Eucosma passerana* Wlshm. Wellington (T. Bryant).
6956. *Eucosma nigralbana* Wlshm. Saanichton (J. W.).
6959. *Eucosma lolana* Kearf. Chilcotin (E. R. B.).
6965. *Eucosma terrococtana* Wlshm. Saanichton (J. G. C.); Powell River (W. B. A.).
6970. *Eucosma abbreviatana* Wlshm. Chilcotin (E. R. B.).
6986a. *Eucosma nisella criddleana* Kearf. Victoria (W. R. C.).
6990. *Eucosma hirsutana* Wlshm. Vavenby (T. A. M.).
7065. *Eucosma striatana* Clem. Mount McLean (A. W. H.).
7082. *Eucosma columbiana* Wlshm. Kamloops (W. B. A.); Chilcotin (E. R. B.).
7148. *Enarmonia haimbachiana* Kearf. Vavenby (T. A. M.).
7175. *Ancylis subæquana* Zell. Goldstream (E. H. B.); Saanichton (J. W.).
7176. *Ancylis discigerana* Wlk. Mount McLean (A. W. H.).
7269. *Melissopus latiferreanus* Wlshm. Saanichton (E. H. B.); Maillardville (E. H. B.; L. E. M.).

Tortricidæ.

7372. *Tortrix packardiana* Fern. Maillardville (L. E. M.).
7443. *Peronea subnivana* Wlk. Hazelton (W. B. A.).
Peronea variegana Schiff. Victoria (W. R. C.; E. H. B.).

Phaloniidæ.

7454. *Phalonia smeathmanniana* Fabr. Vavenby (T. A. M.).

Glyphipterygidæ.

* *Hilarographa youngiella* Busck. Victoria (W. Downes; W. R. C.); Maillardville (L. E. M.).

Plutellidæ.

7664. *Cerostoma schwarziella* Busck. Powell River (W. B. A.); Salmon Arm (W. R. B.).

Yponomeutidæ.

* *Argyresthia monochromella* Busck. Victoria (E. H. B.).

Haploptiliidæ.

7762. *Haploptilia coruscipennella* Clem. Victoria (W. R. C.; E. H. B.); Duncan (A. W. H.); Maillardville (L. E. M.).

7768. *Haploptilia fletcherella* Fern. Victoria (W. R. C.; E. H. B.); Maillardville (L. E. M.).

* *Aphelosetia cygnodiella* Busck. Victoria (W. Downes).

Scythrididæ.

8080. *Scythris eboracensis* Zell. Victoria (E. H. B.).

Tineidæ.

8289. *Tinea granella* Linn. Victoria (E. H. B.; W. R. C.).

Incurvariidæ.

8436. *Incurvaria itoniella* Busck. Wellington (T. Bryant).

Adelidæ.

8448. *Nemotois bellela* Wlk. Vavenby (T. A. M.).

Micropterygidæ.

8480. *Epimartyria pardella* Wlshm. Maillardville (L. E. M.; E. H. B.).

The following notes on some of the new and uncommon species taken during the last two seasons may be of interest to students of this group:—

5151. *Pyrausta borealis* Pack. A short series of this pretty black and yellow pyraustid was taken by Mr. T. A. Moilliet at Vavenby, B.C., on June 1st. These specimens are not quite typical and represent a small dark northern race which seems worthy of a varietal name. We have two similar specimens from Chilcotin taken by Mr. E. R. Buckell on June 2nd, 1920. We also have two specimens of the typical form taken at Lillooet several years ago.

5591. *Ambesa lætella* Grt. This species with its purple and white markings is one of the most handsome of the phycitids and has, until recently, been represented in our collections by a single specimen taken at Rossland, B.C., by the late Mr. Danby. Mr. E. R. Buckell took one specimen at Chilcotin on June 30th, 1920, and the same collector was fortunate enough to capture three more this season between June 18th and the 25th at Nicola Lake, B.C. Mr. T. A. Moilliet also took a single specimen at Vavenby on July 14th.

5600. *Nephopteryx hypochalciella* Rag. Two male specimens of this species, which is new to our list, have been taken by the writer at Goldstream, one on July 3rd, 1918, and the other on August 10th, 1921. It seems very uncommon.

5662. *Pyla æneoviridella* Rag. This genus has been hitherto poorly represented in British Columbia collections. Until quite recently we had only one representative recorded from the Province, which was listed in the 1906 Check-list as *scintillans* Grt., taken on Mount Cheam in 1903. This identification, however, has proved to be wrong, as I have two of the original specimens from the Harvey collection which were determined by Dr. McDunnough in 1919 as *rainierella* Dyar. More recently (April, 1921) Dr. Dyar described a new species taken by the writer at Mount Tzouhalem as *Pyla blackmorella*. An illustration of this species with notes thereon was given in last year's Museum Report.

When collecting on Mount McLean in July, 1919, and again in August, 1921, Mr. A. W. Hanham, of Duncan, succeeded in capturing a number of specimens of this genus. Upon examination I found that they were quite distinct from *rainierella* and involved at least two species. They were sent to Mr. W. Schaus, of the U.S. National Museum, who is an authority on this group. The one species taken in July, 1919, at 5,000 feet altitude proved to be *æneoviridella* Rag., and the other one taken in August, 1921, at 7,500 feet was determined as:—

**Pyla sylphiella* Dyar. This was described from Mount Rainier, near Tacoma, Wash., from specimens taken by Dyar & Caudell in August, 1906. This latter species is a trifle smaller and has purplish-coppery irrorations, while *æneoviridella* is irrorated with greenish-bronze. The majority of the species in this genus are brownish-black in colour, the fore wings being variously irrorated with either purplish, greenish, bronzy, or coppery metallic scales.

5676. *Megasis edwardsialis* Hulst. This is also a new record for the Province. A short series was taken by Mr. E. R. Buckell at Chilcotin the latter end of April, 1920. It is a long narrow-winged species measuring 1⅛ inches in expanse, with the primaries of a dull-grey colour and the secondaries a light fuscous. The females are much smaller than the males, being only ¾ inch when expanded, and having two black transverse lines on the primaries. Unless one was acquainted with this genus, one would never associate the two sexes as belonging to the same species.

5680. *Megasis atrella* Hulst. This is a very similar species to the last, but is a little smaller in expanse and the somewhat obscure markings are slightly different. A small series was taken by Mr. E. R. Buckell at the same time and place as the former species. In the 1906 Check-list *atrella* is recorded from Victoria, but I think this is a misidentification. The only specimen that I have seen from this district is one that I took on March 5th, 1921, and which is closer to *edwardsialis* than to *atrella*, but probably distinct from either.

5969, 1. *Crysoclista villella* Busck. A nice series of this pretty black-and-orange micro was taken by Mr. Marmont and myself at Maillardville on June 19th. It is about ¼ inch in expanse and when in the air resembles a small black fly. We found it in a large patch of scrub willow and it was not beaten from any other tree. The willows were 8 to 9 feet high and the micro was found only on the topmost twigs. We observed none in flight excepting when they were disturbed. The method of capture was to touch the top twigs with the rim of the net, holding it at arm's length, and then one would see a small black speck fly off. A wild jump and a sweep with the net and *villella* was secured. When once in the net, the micro remained perfectly quiet and was easily bottled. A couple of hours' hard work found us with about thirty specimens and a pair of very tired arms. The species was described (Pro. U.S.N.M., Vol. 27, page 768) from a single specimen taken at Seattle, Wash., in 1903. Mr. Busck informs me that this is the first record of this species since it was described in 1904, which makes this a very interesting capture.

5985. *Walshia amorphella* Clem. A single specimen in good condition was taken by Dr. W. R. Buckell at Salmon Arm on June 27th. This seems a somewhat rare insect, as we only have two specimens, both taken by Mr. T. Bryant at Wellington. It is also recorded from Kaslo.

6008. *Mompha eloisella* Clem. This is a new record for the Province and was taken by Mr. T. Bryant at Ladysmith on July 9th, 1909. It is a pretty little moth measuring about ½ inch across the wings. The basal half of the primaries is pure white with two small black dots, while the outer half is golden-brown with a dark-brown longitudinal line through the centre.

6290. *Gelechia fuscotæniella* Cham. Mr. Marmont has taken three specimens of this new record at Maillardville. It is slightly smaller than the preceding species. The primaries are pure white with a small black basal area and a black spot on the costa and another at the apex of the wing. It flies in June.

**Telphusa agrifolia* Braun. This species was described in Ent. News, Vol. 32, page 9, Jan., 1921, from specimens bred from larvæ feeding on California live oak (*Quercus agrifolia*) in Alameda County, California. The writer took a short series of this species at Mount Tolmie in September, 1921, and a long series at the same place in August of this year. It was beaten from scrub oak (*Quercus Garryana*), on which the larvæ undoubtedly feed. It is a small species, measuring about 13 mm. In colour it is blackish-brown with patches of raised scales; in some specimens there is an oblique white band crossing the wing from about one-fourth out. It is very variable.

6156. *Recurvaria gibsonella* Kearf. A single specimen of this pretty little gelechid was taken by Mr. W. R. Carter on June 20th, 1921. This is the first record from British Columbia of this Eastern species. It was described (Can. Ent., Vol. 39, page 4, Jan., 1907) from three specimens bred from larvæ feeding on juniper (*Juniperus communis*) by Mr. Arthur Gibson at Ottawa, Ont.

6288. *Gelechia panella* Busck. Four specimens of this striking brick-red species were taken by the Hon. J. G. Colville at Saanichton on various dates in July and August. It was described (Pro. U.S.N.M., Vol. 25, page 889, 1903) from two specimens, one taken in Arizona and the other in California. Mr. Hanham has taken a few specimens at Duncan during the last few years, but it is not at all common. The larvæ feed on arbutus (*Arbutus Menziesii*). This species was listed in our old Check-list from Wellington, but this is an error, as the species listed under that name is *Gelechia mandella* Busck.

6803, 1. *Exartema appendiceum* Zell. In the Can. Ent. for Feb., 1922, page 39, Dr. J. McDunnough resurrects this species from the synonmy. It had been placed as a synonym of *versicoloranum* Clem., but, although very similar in appearance, can be separated by *versicolor-*

anum having the costa white at the base, while *appendiceum* has a dark basal area. The species occurring in British Columbia are the latter and the two specimens recorded in last year's Museum Report under the name of *versicoloranum* (taken by Mr. Marmont at Maillardville) should be changed accordingly. A nice series of this moth was taken this season by Captain J. Wise at Saanichton in June and July.

6820. *Argyroploce wellingtoniana* Kearf. This is a fine capture, as no specimens have been recorded since the species was described (Trans. Am. Ent. Socy., Vol. 33, page 13, Feb., 1907) from two specimens taken by the late Rev. G. W. Taylor at Wellington on May 19th, 1906. The writer took two specimens in fine condition on May 23rd of this year about 7 p.m., and although a careful search was made on following evenings no more were found. A single specimen was also taken by the Hon. J. G. Colville at Saanichton on June 5th. It expands about 18 mm. and the primaries are mottled with white, grey, dark fuscous, and black.

7028. *Eucosma similana* Hubn. Two nice specimens of this species were taken by Mr. T. A. Moilliet at Vavenby on September 16th and 20th. At first glance it is very similar to *lolana* Kearf., illustrated on Plate VI., but is slightly smaller and has pale hind wings instead of dark-brown ones. This species has been previously recorded from Kaslo; it occurs in the Atlantic States, is common in Great Britain, and also extends through Central Europe and Northern Asia.

7161. *Enarmonia medioplagata* Wlshm. This is another uncommon species, only previously reported from Kaslo. Mr. Moilliet took two specimens in good condition at Vavenby in July, and Mr. E. R. Buckell took a single rather worn specimen at Chilcotin on August 2nd, 1921.

7269. *Melissopus latiferreanus* Wlshm. This is another new record for the Province. It is represented in our collections by three specimens taken in June of this year. While visiting Mr. Marmont at Maillardville, I captured a beautiful specimen of this species on the last day of my stay, June 20th, and on the same morning Mr. Marmont captured another one. Two days later, while spending a day at the home of Viscount Colville at Saanichton, I captured a third specimen. Strange to say, although persistent collecting was carried on by both the Hon. Mr. Colville and Mr. Marmont, no more specimens of this species were captured. The fore wings are reddish-brown in colour with a purplish sheen and a small patch of burnished copper in the median area.

7532. *Commophila fuscodorsana* Kearf. This species has not been represented in our collections until this year. Mr. W. R. Carter took two specimens on June 15th in Pemberton Woods near Victoria. Mr. Marmont captured another one on May 31st at Maillardville, while the writer secured a freshly emerged specimen on Mount Tolmie on June 10th. The species was described (Can. Ent., May, 1904, page 137) from two male specimens, one taken at Fieldbrook, Cal., and the other taken by Mr. Cockle at Kaslo. This is a good record.

7623. *Choreutis leucobasis* Fern. This interesting capture was made by Mr. Marmont at Maillardville, who took two specimens on May 12th. This is the first record that we have had since Mr. T. Bryant captured a specimen at Wellington on May 3rd, 1903. The species was described (Can. Ent., Vol. 32, page 242, 1900) from specimens taken at London, Ont., and Massachusetts. It has also been recorded from Vermont.

7664. *Cerostoma schwarziella* Busck. This is a new record for the Province. Mr. W. B. Anderson took a single specimen in good condition at Powell River on August 4th, 1921. This season three specimens were taken by Dr. W. R. Buckell at Salmon Arm on May 16th.

8480. *Epimartyria pardella* Wlshm. This is one of the most interesting finds that we have yet had, and I believe that I am right in stating that this is the first record of this species being taken in Canada. It was first taken by Mr. Marmont at Maillardville in June, 1921. Mr. August Busck, to whom it was submitted for determination, was very anxious to get additional material, as it is somewhat of a rarity in collections, the U.S. National Museum only containing two specimens which were taken by Professor C. V. Piper at Seattle, Wash.

With this end in view the writer spent a week in June with Mr. Marmont at his home in Maillardville, which is ideally situated for collecting purposes. The second day I was there—June 15th, to be exact—we proceeded to the spot where Mr. Marmont had collected the species the previous year. This was an old disused lane, now very much overgrown. The sides were lined with small trees and shrubs of many kinds, while the undergrowth was very dense. We had not been there many minutes before we spotted one or two resting upon the leaves of various plants, and by careful and steady work we bottled some fifty-two specimens between us in a couple of hours. Bottling them off the plants was the only possible way to get them, as when in

PLATE V.

ARCTIIDÆ—NOCTUIDÆ—NOTODONTIDÆ—THYATIRIDÆ.

Æmilia roseata Wlk.
Fraser Mills, B.C. (L. E. Marmont).
(Exceedingly rare.)

Papaipema insulidens Bird.
Fraser Mills, B.C. (L. E. Marmont).
(Rather rare.)

Gluphisia septentrionales Wlk.
Vavenby, B.C. (T. A. Moilliet).
(New to British Columbia.)

Aplectoides occidens Hamps.
Saanichton, B.C. (J. G. Colville).
(Very rare.)

Oncocnemis cibalis Grt.
Lillooet, B.C. (A. W. Phair).
(Very rare.)

Oncocnemis levis Grt.
Fort Steele, B.C. (W. B. Anderson).
(New to British Columbia.)

Perigrapha algula Sm.
Vavenby, B.C. (T. A. Moilliet).
(Uncommon.)

Perigrapha achsha Dyar.
Vavenby, B.C. (T. A. Moilliet).
(Rather rare.)

Gluphisa septentrionalis quinquelinea Dyar.
Vavenby, B.C. (T. A. Moilliet).
(Rather rare.)

Zale benesignata Harvey.
Salmon Arm, B.C. (W. R. Buckell).
(New to British Columbia.)

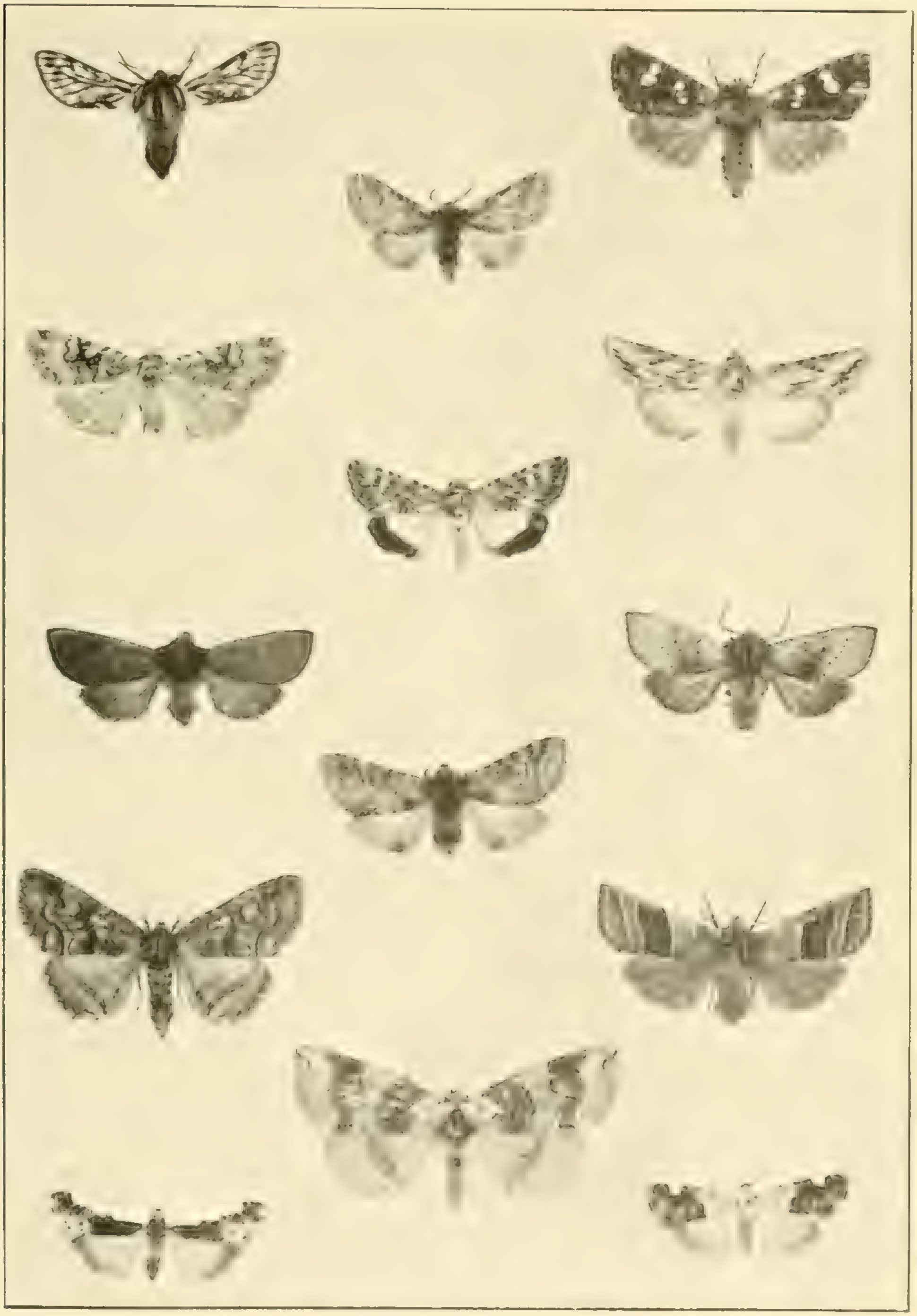
Conistra fringata B. & McD.
Salmon Arm, B.C. (W. R. Buckell).
(New to British Columbia.)

Euthnatia semicircularis Grt
Fraser Mills, B.C. (E. H. Blackmore).
(Rather uncommon.)

Tarache major Sm.
Rossland, B.C. (W. H. Danby).
(Very rare.)

Tarache areli Streck.
Rossland, B.C. (W. H. Danby).
(Rather rare.)

PLATE V



flight they are almost invisible. The species is rather small, expanding only 11 mm., and the wings are very narrow, the fore wings being about ½ mm. broad and the hind wings about 1 mm. It is an extremely handsome insect when viewed under a lens, all the wings being of an iridescent purple with a large golden spot on the fore wings about two-thirds out from the base. We also took three or four specimens which were unspotted. At first these were thought to be a different species, but later on Mr. Busck made slides of the wings and genitalia, which disproved that idea. He considers them to be merely varieties of the typical form.

This species is interesting from the fact that it is a representative of the family Micropterygidæ, which is the most primitive family of all the Lepidoptera. The fore and hind wings each contain twelve veins, and a jugum is developed at the base of the inner margin, which serves as a wing-coupling apparatus. This family is very closely allied to the order Trichoptera (caddice-flies), and it is from this latter order that the Lepidoptera have undoubtedly evolved.

ILLUSTRATED LEPIDOPTERA.

Arctiidæ (Plate V.).

929. *Æmilia roseata* Wlk. Taken by Mr. L. E. Marmont at Maillardville on July 2nd, 1922. This is one of the finest captures of the season, as it is the rarest of all our species in this family. The specimen illustrated is the first one taken since 1906 that I have any knowledge of. In the 1906 Check-list it is recorded from Goldstream and Mission. I have not been able to find any trace of the Goldstream specimen and I know nothing of the one from Mission. In the Bull. B.C. Ent. Socy., Sept., 1906, under the heading of "Notes on the Season of 1906," it says: "Mr. Harvey received from a friend a fine specimen of *Æmilia roseata*, taken early in July on the Squamish River." This record is authentic, as I found the specimen referred to in the Harvey collection.

Noctuidæ (Plate V.).

1507. *Aplectoides occidens* Hamp. This is another very fine record, as very few specimens of this species have been taken in the Province. The specimen illustrated was taken by the Hon. J. G. Colville at Saanichton on August 15th, 1922, and is the first that I have seen since I discovered a specimen in the Bryant collection which was taken at Wellington on August 4th, 1902. This latter specimen was labelled "*Hadena mustelina* Sm." and was listed under that name in the 1906 Check-list. I had great difficulty in getting this species determined, as it was not represented either in the Canadian National Collection or the U.S. National Museum. Later Dr. J. McDunnough identified it from the co-type in the Wolley Dod collection, which was bequeathed to the Dominion Government by the late F. H. Wolley Dod. Dr. McDunnough also informed me that they have a specimen from Ucluelet, which is on the west coast of Vancouver Island. In the Entomological Record for 1919 Gibson and Criddle record a specimen of *occidens* taken by Mr. J. B. Wallis at Sicamous, B.C., on August 12th, 1915. I have also recently determined a specimen as this species for Mr. A. W. Hanham, taken at Quamichan Lake, V.I., on August 23rd, 1918. These five records are the only ones that I know of from this Province.

1900. *Perigrapha algula* Sm. Three specimens were taken by Mr. T. A. Moilliet at Vavenby on April 30th, 1922. We were glad to get these, as this species was not previously represented in our collections. I have seen specimens from Kaslo, where Mr. Cockle takes it occasionally, and Dr. W. R. Buckell also records it from Salmon Arm.

1901. *Perigrapha achsha* Dyar. A single specimen of this species was also taken by Mr. Moilliet on April 20th. This is a rather rare species, as I have only seen two other specimens in British Columbia collections; one was taken in the Penticton District by Mr. E. M. Anderson in 1913, and the other by Mr. G. O. Day at Quamichan Lake, near Duncan. This latter is rather an unexpected locality, but I do not think that there is any doubt about the determination, as it agrees with the Penticton specimen which was determined for me by Dr. A. W. Lindsey. In the Barnes collection at Decatur, Ill., is a specimen from Arrow Lake, B.C., which has been compared with the type, and the Penticton specimen agrees with this. *Algula* and *achsha* are closely allied and have been somewhat confused in collections, but can be differentiated by the fact that *achsha* is hoary grey powdered, except in the inner part of median and basal areas, while *algula* is evenly coloured and ranges from dark slaty grey to a purplish red.

2030. *Oncocnemis levis* Grt. This fine noctuid was captured by Mr. W. B. Anderson at Fort Steele on September 16th, 1918, and as far as I am aware has not previously been recorded from

British Columbia. It was described in 1880 from specimens taken in Arizona and Colorado, and it has also been recorded from Lethbridge, Alta.

2048. *Oncocnemis cibalis* Grt. The specimen illustrated was taken by Mr. A. W. Phair at Lillooet on September 15th, 1918. This species was also described (Can. Ent., Dec., 1880) from Colorado at the same time as the preceding. A rather worn specimen of this species was also taken by Mr. W. B. Anderson at Lytton on September 24th, 1922.

2215, 1. *Conistra fringata* B. & McD. This is a new record for the Province and was captured by Dr. W. R. Buckell at Salmon Arm on October 9th, 1921. It was described (Cont. Lepid. No. Amer., Nov., 1916, page 9) from a single male taken at Truckee, Cal. It is closely allied to *devia* Grt., but is a larger and prettier insect, the prevailing colour being a bright red-brown, although the maculation is practically the same.

2673. *Papaipema insulidens* Bird. A single specimen was taken by Mr. L. E. Marmont at Maillardville on September 9th, 1922. This capture extends its known range, as hitherto it has not been recorded outside of Vancouver Island. The species was described (Can. Ent., May, 1902, page 112) from three specimens from Vancouver Island. Mr. G. O. Day has taken it sparingly at Quamichan Lake for several years. Its food-plant unfortunately still remains undiscovered.

2977. *Tarache major* Sm. The specimen illustrated was taken by the late Mr. W. H. Danby at Rossland on July 20th, 1899. It is rather a striking-looking species and must be exceedingly rare in the Province, as this is the only example I have seen, although Mr. Cockle has taken it at Kaslo. It is evidently a mountainous species and was described from Colorado in 1900.

2982. *Tarache areli* Stkr. This specimen was also taken by Mr. Danby at Rossland and is the only other representative of the genus occurring in British Columbia. This species is nearly, if not quite, as rare as the preceding. It has been taken at Kaslo (Cockle) and a single specimen was recorded in last year's Museum Report as being taken by Mr. J. Wynne at Enderby, B.C.

3187. *Zale benesignata* Harvey. This is a fine record and is new to the Province. It was taken by Dr. W. R. Buckell at Salmon Arm on May 19th, 1921. The species was described (Bull. Buff. Soc. Nat. Sci., Vol. 3, page 14, 1875) from specimens taken at Webster, N.H., and Indian River, Fla. In the 1906 B.C. Check-list the three species, *lunata* Drury, *calycanthata* S. & A., and *duplicata* Bethune, listed under the generic name of Homoptera (= Zale) are all incorrect. I have seen a number of specimens from different collections labelled *lunata*, and these are all without a doubt *norda* Sm., which was described (Pro. U.S.N.M., Vol. 35, page 237, 1908) from specimens taken at Kaslo, Rossland, and Arrow Lake, B.C., and Cartwright, Man. *Calycanthata*, recorded by Dr. Dyar (Pro. U.S.N.M., Vol. 27, page 879, 1904) from Kaslo, is also this species. *Duplicata*, listed from Wellington (Taylor), is almost certain to be *largera* Sm., described (Pro. U.S.N.M., Vol. 35, page 257, 1918) from two specimens, one from Wellington, B.C., and one from Winnipeg, Man.; in fact, it is quite possible that the specimen listed in our Check-list was the identical specimen which Smith made the male type of his species. Our species in this genus will now stand as follows:—

Zale Hbn.
    minera race *norda* Sm. Vancouver Island; Southern British Columbia.
    benesignata Harv. Salmon Arm.
        race *largera* Sm. Wellington; Princeton.

Notodontidæ (Plate V.).

3680. *Gluphisia septentrionalis* Wlk. A single specimen taken by Mr. T. A. Moilliet at Vavenby on June 10th, 1922. We are glad to have this record, as it is the first authentic typical specimen of this species that we have seen. The species taken at Kaslo and listed under this name are of the form *quinquelinea* Dyar. *Septentrionalis* has a very wide range and should occur wherever aspen and cottonwood are found. It varies in colour a great deal according to the locality, and varietal names have been given to many of these geographical races.

3680D. *Gluphisia septentrionalis* race *quinquelinea* Dyar. A single specimen of this form was also taken at the same place and on the same date as the preceding. It was described by Dyar (Ent. News, Vol. 3, page 168, 1892) from one male taken at Portland, Ore.

Thyatiridæ (Plate V.).

3695. *Euthyatira semicircularis* Grt. The specimen illustrated was taken by the writer at Maillardville on June 19th, 1922. Previous to this capture this species has only been taken at one locality in the Province—namely, Quamichan Lake, near Duncan. Both Mr. Day and

PLATE VI.

GEOMETRIDÆ.

Itame denticulodes Hulst.
Vavenby, B.C. (T. A. Moilliet).
(Very rare.)

Xanthorhöe incursata harveyata C. & S.
(Female paratype.)
Vancouver, B.C. (R. V. Harvey).
(New to science.)

Eupithecia ecnataria C. & S.
Goldstream, B.C. (E. H. Blackmore).
(New to science.)

Xanthorhöe ramaria delectaria C. & S.
(Male paratype.)
Atlin, B.C. (E. M. Anderson).
(New to science.)

Xanthorhöe aquilonaria C. & S.
(Male paratype.)
Atlin, B.C. (E. M. Anderson).
(New to science.)

Eupithecia scabrogata gilvipennata C. & S.
(Male holotype.)
(Wellington, B.C. (T. Bryant).
(New to science.)

MICROLEPIDOPTERA.

Nemotois bellela Wlk.
Vavenby, B.C. (T. A. Moilliet).
(New to British Columbia.)

Peronea variegana Schiff.
Victoria, B.C. (E. H. Blackmore).
(New to North America.)

Aegeria tibialis Harris.
Marron Lake, B.C. (C. deB. Green).
(Very local.)

Ethmia monticola Wlshm.
Chase, B.C. (W. B. Anderson).
(New to British Columbia.)

Amorbia cuneana Wlshm.
Saanichton, B.C. (J. Wise).
(Somewhat local.)

Melitara dentata Grt.
Nicola Lake, B.C. (E. R. Buckell).
(New to British Columbia.)

Cacoecia victoriana Busck.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Agonopteryx blackmori Busck.
(Male co-type.)
Victoria, B.C. (E. H. Blackmore).
(New to science.)

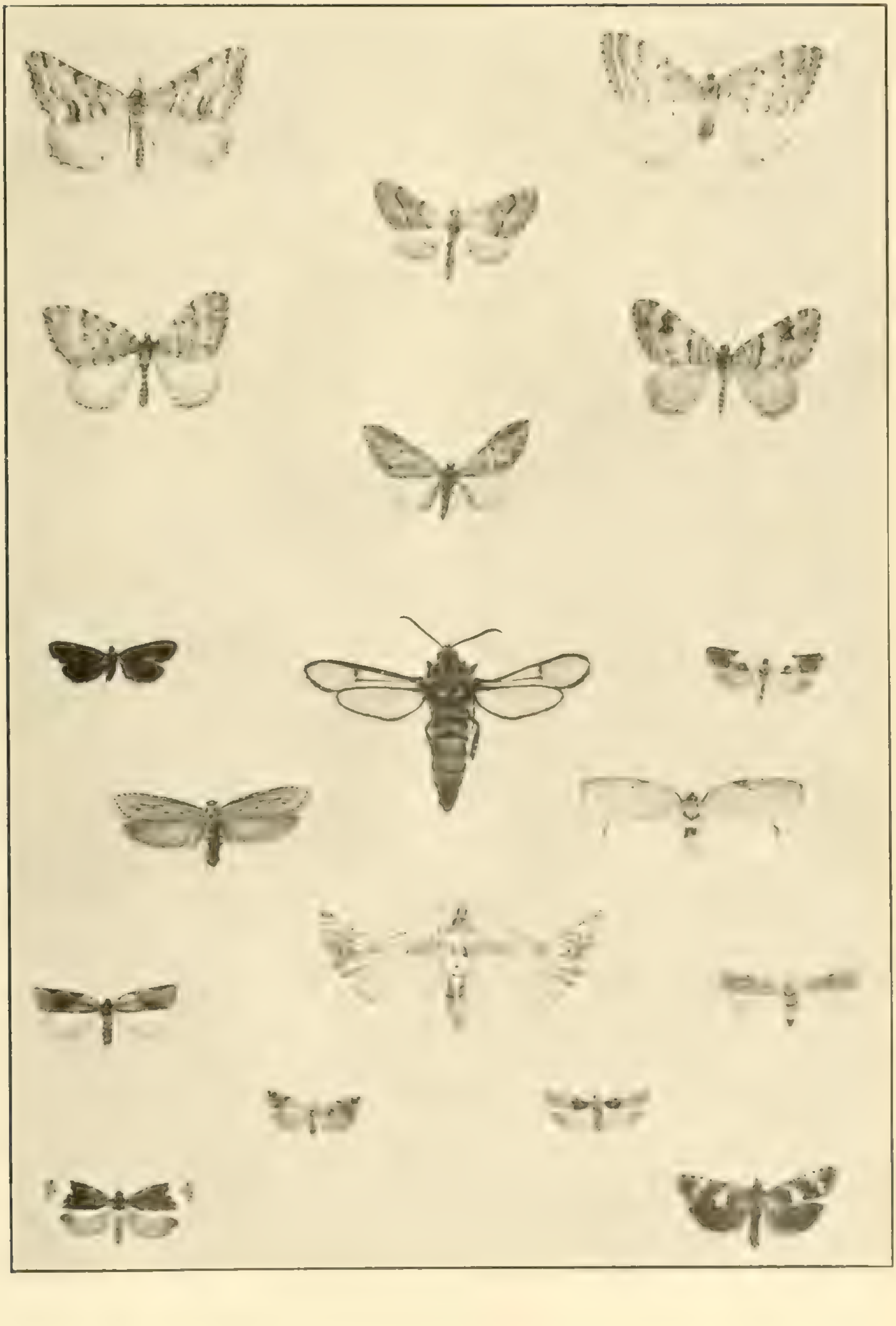
Eucosma terrococtana Wlshm.
Saanichton, B.C. (J. G. Colville).
(New to British Columbia.)

Eucosma nisella criddleana Kearft.
Victoria, B.C. (W. R. Carter).
(New to British Columbia.)

Argyroploce capreana Hbn.
Fraser Mills, B.C. (L. E. Marmont).
(Uncommon.)

Eucosma tolana Kearft.
Chilcotin, B.C. (E. R. Buckell).
(New to British Columbia.)

PLATE VI.



Mr. Hanham have taken it there occasionally during the past few years, but this season, for some unknown reason, it was more plentiful, Mr. Day taking four specimens and Mr. Hanham about seven or eight. It was described from the State of Washington in 1881.

Geometridæ (Plate VI.).

******Xanthorhœ incursata* race *harveyata* Cassino & Swett. This new race was described from specimens taken by the late Captain R. V. Harvey on July 2nd, 1904, at Vancouver, probably on Grouse Mountain. The types are in good condition, but the paratypes are rather worn. It is closely related to *lagganata* Swett.

**Xanthorhœ ramaria* race *delectaria* Cassino & Swett. Described from a short series in rather poor condition taken by E. M. Anderson at Atlin on various dates in June, 1914. It is superficially like the *incursata* group, but the genitalia prove it to be unrelated and show it to belong to *ramaria*, which was described from Labrador.

**Xanthorhœ aquilonaria* Cassino & Swett. This new species was taken by E. M. Anderson at Atlin in June, 1914. A few of the specimens (including the types) are in good condition, but the majority are rather rubbed. The species is closely allied to *congregata* Wlk. and *trilineata* Warr., both of which are North American races of the European *abrasaria* H.S. Slides have been made of the genitalia, which show it to be related to the above three forms, but enough differences are noted to warrant specific distinction. More recently I have seen specimens referable to this species, which were taken on Mount McLean by Messrs. Day and Hanham.

**Eupithecia cenataria* Cassino & Swett. This new species was described from a number of specimens taken "at light" by the writer at Goldstream in September, 1920. The specimens were in a somewhat rubbed condition, as it was rather late in the season for them. I have found out since that the species emerges about the last week in July. In 1921 I took two or three in fine condition during that period. Mr. Marmont also took a specimen at Maillardville on July 28th of this year. This is the same species that has been recorded from Wellington under the name of *unicolor* Hulst., but the latter, although having the same general appearance, is a larger insect. *Unicolor* was described (Trans. Am. Ent. Soc., Vol. 23, page 271, 1896) from specimens taken in California and Colorado.

**Eupithecia scabrogata* form *gilvipennata* Cassino & Swett. Described from a single male specimen taken by Mr. T. Bryant at Wellington on May 9th, 1902. This form differs from typical *scabrogata* Pears, by having the entire central portion of the primaries a deep yellow instead of a dark fuscous. A figure of *scabrogata* was given on Plate IV., Report, Prov. Mus., 1921.

4423. *Itame denticulodes* Hulst. The specimen illustrated was taken by Mr. T. A. Moilliet at Vavenby on June 28th, 1922. This is a rather uncommon species in this Province. I have a specimen taken by the late Captain Harvey on July 22nd, 1908, at Similkameen, and it has been recorded from Kaslo (Cockle). I do not know of any other records.

Pyralidæ (Phycitinæ) (Plate VI.).

5694. *Melitara dentata* Grt. This is a good capture and is in fine condition. It was taken by Mr. E. R. Buckell at Nicola Lake on August 29th, 1922. I have only seen one other specimen, and that was taken by Mr. A. W. Phair at Lillooet on August 30th, 1916. The species was originally described from Colorado.

Œcophoridæ.

**Agonopteryx blackmori* Busck. Described from specimens bred by the writer from larvæ feeding upon broom. The date of the bred species is July 12th, 1918. Since then I have taken it commonly at the end of August and all through September wherever broom is growing. In a recent letter from Mr. Edward Meyrick, of Marlborough, Eng., who is a world authority on this group, he states his belief that this species is conspecific with the European *costosa* Haw. If this proves correct, *blackmori* will become a synonym of *costosa*, but will become a new record for North America.

Ethmiidæ.

6624. *Ethmia monticola* Wlshm. This fine specimen was taken by Mr. W. B. Anderson at Chase on May 27th, 1918, and is a new record for the Province. It is a beautiful species, being dove-grey in colour with a few fine black markings on the primaries; the abdomen is a bright golden-yellow. The species was described from Colorado by Lord Walsingham in 1880.

Ægeriidæ.

6654. *Ægeria tibialis* Harris. This interesting clearwing was taken by Mr. C. de Blois Green at Marron Lake in July of this year. Several specimens were taken, but as Mr. Green did not have the proper means of killing them at hand, they were, with the exception of the one figured, in rather poor condition. We are very pleased to have this species, as although it has never been listed in any of our local lists, Mr. Wm. Beutenmuller, in his "Monograph of the Sesiidæ of North America," published in 1901, gives, amongst other places, British Columbia and Vancouver as localities for this species. It has been taken in the New England States, Colorado, and California. The illustration is that of the female; the male is somewhat smaller, averaging 5 mm. less in alar expanse, and is not so robust. The larvæ bore into the trunks of willow and poplar. Mr. Green found the empty pupal cases on "cottonwood," probably *Populus trichocarpa.*

Eucosmidæ.

6818. *Argyroploce capreana* Hub. The specimen illustrated was taken by Mr. Marmont at Maillardville on July 7th, 1922. It is not a common insect by any means, as it only occurs sparingly in any given district. Captain J. Wise took a single specimen at Saanichton on July 1st. Mr. Cockle has taken a few specimens at Kaslo and Mr. T. Bryant has three specimens in his collection taken at Wellington. These latter are labelled *frigidana* Pack., but they are undoubtedly *capreana.* I have also seen a poor specimen from Lillooet (Phair) which is referable to this species. It is a European insect and feeds on *Salix sp.*

6959. *Eucosma lolana* Kearf. This interesting species was taken by Mr. E. R. Buckell at Chilcotin on July 16th, 1921, and is a new addition to our list. It was described (Trans. Am. Ent. Soc., Vol. 33, page 31, 1907) from two specimens taken at Colorado.

6965. *Eucosma terrococtana* Wlshm. A long series of this very pretty little micro, which is new to the Province, was taken by the Hon. J. G. Colville at Saanichton during June and July of this year. It was beaten from arbutus trees exclusively, and it is very probable that this is its food-plant. Mr. W. B. Anderson also took four specimens of this species at Powell River on July 14th. These were beaten from *Arctostaphylos tomentosa. Terrococtana* was described in 1879 by Lord Walsingham from specimens taken in California.

6986A. *Eucosma nisella* form *criddleana* Kearf. A long series of both *nisella* and the form *criddleana* was taken by Mr. W. R. Carter at Victoria on various dates during July of this year. The species is very variable; in colour it ranges from whitish-grey to cinereous-grey, with scattered black scales; in some specimens there is a red-brown, somewhat triangular blotch on the inner margin of the primaries; in others the basal area is solid black; this latter is the form *criddleana.* The typical form is common in England and Ireland and also occurs in Central Europe. The larvæ feed in catkins and on leaves of poplar and willow. *Criddleana* was described (Can. Ent., Vol. 39, page 58, 1907) as a distinct species from specimens taken at Aweme, Man. (Criddle), and Rounthwaite, Man. (Marmont). It was placed by Kearfott in the genus *Proteopteryx* Wlshm., but it has recently been removed from there and placed as a form of *nisella* by Mr. Carl Heinrich.

Tortricidæ.

7285. *Amorbia cuneana* Wlshm. Captain J. Wise took a long series of this species in fine condition at Saanichton from June 19th to July 2nd. This is the largest of our tortricids, the male averaging 32 mm., while the female measures 38 mm. when expanded. We are pleased to have this nice series, as we have previously only had a few odd specimens taken at Quamichan Lake (Hanham) and Wellington (Bryant). Mr. W. B. Anderson also took four male specimens at Powell River on July 14th. The females are very much scarcer than the males, the latter preponderating in the proportion of seven to one. The larvæ feed upon the leaves of arbutus (*Arbutus Menziesii*).

**Cacœcia victoriana* Busck. This species was described from three specimens taken by the writer at Victoria and Goldstream in July, 1920. I have since taken two more specimens, one on June 23rd and the other on June 30th, 1921, and as these are in better condition than the type series I am using one of them for illustration.

Peronea variegana Schiff. This is the first published record of this common European species having been taken in North America. A single specimen was taken by Mr. A. Meugens at Victoria on July 20th, 1920. This stood as unique in my collection until this fall, when I took a nice series in my own garden during the second week of September. Mr. W. R. Carter also took a number of specimens at Esquimalt about the same time. It is a very variable insect, but the variation seems to run along two distinct lines. In the one form the outer area of the primaries is a dark slate and the inner area a clear pure cream; in the other the outer half is a reddish-brown, while the basal area is a chalky-white, with a small dark triangular blotch with its base resting on the inner margin. Meyrick (Hdbk. Brit. Lepid., 1895) gives its food-plant as hawthorn, blackthorn, rose, etc.

Adelidæ.

8448. *Nemotois bellela* Wlk. This new record was taken by Mr. T. A. Moilliet at Vavenby on May 28th, 1922. Only one specimen was taken, but that was in a beautifully fresh condition. It is rather a handsome insect, especially when viewed under a lens. The ground colour of the primaries is yellow, which is mostly obscured by overlying dark-brown scales which heavily outline the entire margin of the wing as well as the veins, thus giving it a general dark-brown effect. The narrow transverse band is bright yellow, bordered on both sides by light-blue scales. The secondaries are dark brown and when viewed in certain lights the whole insect has a strong purplish reflection.

The genus *Nemotois* Hub. is rather a large one, containing as it does something over eighty species, most of which occur in Europe, India, and Japan; *bellela*, however, being the only North American representative. The species was described by Walker in 1863 and the only locality then given was "Canada."

Notes and Corrections.

In the Entomological News for July, 1922 (Vol. 33, page 211), there is an article by Dr. A. W. Lindsey entitled "Notes on the Distribution and Synonymy of some Species of Pterophoridæ." The greater part of the "notes on distribution" deal with British Columbia specimens sent by me to Dr. Lindsey for determination, and are included in my paper on "The Pterophoridæ of British Columbia," which appeared in the Ann. Rept., Prov. Museum, 1921, page 34 *et seq.* Included in Dr. Lindsey's paper are "Notes on the Synonymy" communicated to him by Mr. Edward Meyrick, of Marlborough, Eng.

As two of the species mentioned occur in British Columbia, it is thought advisable to refer to them here, as corrections to my paper, noted above. Mr. Meyrick expresses the belief that *Platyptilia shastæ* Wlshm. and *fragilis* Wlshm. are synonyms of *albida* Wlshm. In this view Dr. Lindsey concurs, and the name *albida* Wlshm. should be substituted for *fragilis* on page 38 of the Ann. Rep., Prov. Mus., 1921.

Further, Mr. Meyrick says: "*Orneodes* (Alucita) *montana* Ckrll. is in my opinion a synonym of *huebneri* Wall. (Europe, throughout Africa and Kashmir)." In his letter to Dr. Lindsey he also discusses the characters which lead him to this conclusion. As Mr. Meyrick is a world-wide authority on this group, it would be idle to dispute his dictum on the matter, and it would be well to substitute *huebneri* Wall. for *montana* Ckrll. on page 45, l.c.

In a letter received some time ago from Dr. J. McDunnough, of Ottawa, he states that specimens sent by me for the Canadian National Collection are not *Oidaematophorus corvus* B. & L. as labelled, but are the closely allied species *stramineus* Wals. Dr. McDunnough has made a slide of the male genitalia, which conclusively proves this fact. The specimens in question were taken by me at Goldstream in July, 1920. This locality, together with that of Fraser Mills, must be removed from the list of localities given under *corvus* and placed under *stramineus* (*see* page 43, l.c.). *Corvus*, which occurs in the eastern portion of the Province, is a somewhat larger insect and has a much smokier appearance than *stramineus*.

VICTORIA, B.C.:
Printed by William H. Cullin, Printer to the King's Most Excellent Majesty.
1923.

PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

PROVINCIAL MUSEUM

OF

NATURAL HISTORY

FOR THE YEAR 1923

PRINTED BY
AUTHORITY OF THE LEGISLATIVE ASSEMBLY.

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1924

To His Honour Walter Cameron Nichol,

Lieutenant-Governor of the Province of British Columbia.

May it please Your Honour:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History for the year 1923.

J. D. MacLEAN,

Provincial Secretary.

Provincial Secretary's Office,

Victoria, B.C., February, 1924.

Provincial Museum of Natural History,
Victoria, B.C., February 14th, 1924.

The Honourable J. D. MacLean, M.D.,
Provincial Secretary, Victoria, B.C.

Sir,—I have the honour, as Director of the Provincial Museum of Natural History, to lay before you the Report for the year ended December 31st, 1923, covering the activities of the Museum.

I have the honour to be,
Sir,
Your obedient servant,
FRANCIS KERMODE,
Director.

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DEPARTMENT *of the* PROVINCIAL SECRETARY.

The Honourable J. D. MacLean, M.D., *Minister.*

J. L. White, *Deputy Minister.*

PROVINCIAL MUSEUM OF NATURAL HISTORY.

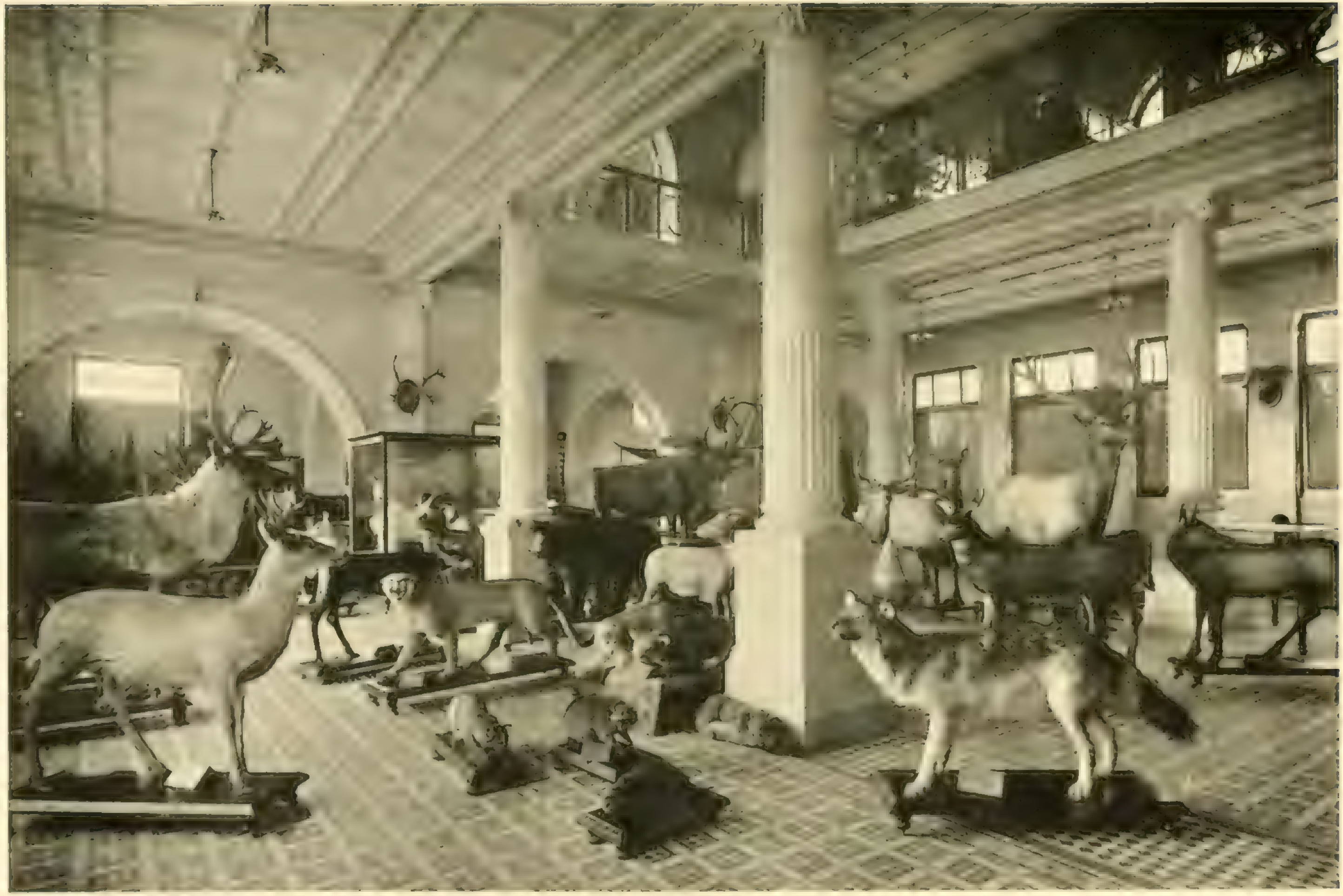
Staff:

Francis Kermode, *Director.*

Winifred V. Redfern, *Recorder.* William R. Carter, *Assistant Biologist.*

Ernest H. Blackmore, *Associate Curator of Entomology.*

Reginald W. Park, *Attendant.* Edward A. Cook, *Attendant.*



MAMMALS IN PROVINCIAL MUSEUM, VICTORIA, B. C.

REPORT *of the*

PROVINCIAL MUSEUM OF NATURAL HISTORY

FOR THE YEAR 1923.

By Francis Kermode, Director.

OBJECTS.

(*a.*) To secure and preserve specimens illustrating the natural history of the Province.

(*b.*) To collect anthropological material relating to the aboriginal races of the Province.

(*c.*) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and diffuse knowledge regarding the same.

ADMISSION.

The Provincial Museum is open, free, to the public daily throughout the year from 9 a.m. to 5 p.m. (except New Year's Day, Good Friday, and Christmas Day); it is also open on Sunday afternoons from 1 p.m. to 5 p.m. from May 1st until the end of October.

VISITORS.

The actual number of visitors whose names are recorded on the register of the Museum is 30,568, against 21,307 in last year's report. This does not by any means give the total number of visitors throughout the year, as not only have more visitors been noticed, but the attendance of school classes has greatly increased, while the classes from the Normal School have used the collections considerably in regard to making drawings in connection with their nature-studies. The following figures will give some idea of those who recorded their names during the months of: January, 1,400; February, 1,031; March, 2,460; April, 1,214; May, 1,960; June, 2,940; July, 5,751; August, 7,045; September, 2,896; October, 1,598; November, 981; December, 1,292.

ACTIVITIES.

During the month of March last, from the 19th to the 26th, a photographic exhibition of the wild life of Canada was forwarded from the Ottawa Field Naturalists' Club, Ottawa, to the Natural History Society of British Columbia. The President of the Society made application to the Director of the Provincial Museum to see if space could be provided for the exhibition of these photographs of nature-studies, as it was thought by the Society that the Provincial Museum of Natural History would be the most suitable place to have these pictures shown, as it was in keeping with the objects of the Museum. The Director took the matter up with the Honourable Provincial Secretary, Dr. J. D. MacLean, M.D., and permission was granted to hold this exhibition on the main floor of the Museum. Arrangements were made whereby specimens were crowded to one side so as to give ample room for visitors.

The exhibition was under the distinguished patronage of His Honour the Lieutenant-Governor and Mrs. Nichol, who spent a considerable time going over the many beautiful photographs of birds in their native haunts. They were conducted by Mr. W. N. Kelly, the President of the Society, and the Director of the Museum. His Honour and Mrs. Nichol expressed their great appreciation of the pictures.

During the week that this exhibition was on view over 1,000 persons came to view it. The Natural History Society undertook the advertising of this display in the press and also in the city and municipal schools. The Department was kept busy arranging times whereby the pupils could be accommodated to visit the exhibition without overcrowding, which was arranged satisfactorily. This educational exhibition of wild life was first displayed in Victoria before being sent throughout Canada, and proved a great success. It is to be hoped that the Ottawa Field Naturalists' Club will be able in the near future to send a similar exhibit, as it was one of the best series of wild-life photographs ever exhibited in Canada.

The Director also arranged, with the consent of the Honourable Provincial Secretary, for an illustrated lecture on "Indian Art in relation to Canadian Trade-marks and Designs," to be given in the Museum for the Natural History Society of British Columbia by Mr. Harlan I. Smith, Archæologist, Victoria Memorial Museum, Ottawa. This lecture was given on the evening of September 27th, the main floor of the Museum being once more arranged to accommodate the members of the Society and their friends. The lecturer gave a highly intelligent talk on Indian archæology and illustrated on the screen many beautiful trade-marks and designs that had been copied from Indian designs. Over 100 persons were present and a unanimous vote of thanks was extended to Mr. Smith for his very instructive lecture, which was greatly appreciated by all present.

Many complimentary remarks and letters have been received by the Department with reference to the Annual Report and the excellent scientific work that is being carried on in this Province, and it is very gratifying to note that the work carried on by this Department with such a small staff is so greatly appreciated.

Towards the end of the year a room on the main floor which has been an office for some time has been converted into the Provincial Herbarium. New cabinets having been constructed, the specimens are now being installed. There are over 6,000 specimens representing the flora of the greater portion of British Columbia, which are now available for study and which will be of great interest to those who take up the study of botany in British Columbia. It is the object of the Department to have these specimens as easily available as possible, and on account of the number of teachers who bring their classes at different times through the year to visit the Museum, the Department will have many of the specimens, more particularly the common flora within the vicinity of Victoria, exhibited in glass-covered double frames, mounted on stands, and therefore easily viewed by the children in their study of the wild flowers of this district. There is also a duplicate collection, approximately one-half the number of specimens, which are kept for study and comparison, showing the variations due to altitude and climatic conditions. Further notes in regard to the botanical section will be found in the report by Mr. W. R. Carter, the Assistant Biologist of the Department.

The thanks of the Director are extended to C. V. Piper, E. W. Nelson, Dr. C. F. Newcombe, and numerous persons whose names are in accessions for their donations received.

Professor C. V. Piper, who is the Agrostologist of the Department of Agriculture, Washington, D.C., has given a good deal of advice and has spent considerable time in the examination and determination of many specimens for this Department. Professor Piper was in this city in September; he is a native son of Victoria and had not lived here for over forty years. The Director, accompanied by Dr. C. F. Newcombe, Mr. J. R. Anderson, and the President of the Natural History Society, Mr. W. N. Kelly, spent an afternoon in going around the suburbs of Victoria with Professor Piper, who wished to see many of the old places of his boyhood days, also to see as much as possible of the plant-life of this vicinity. He expressed the desire to return to Victoria at an early date, and kindly offered to help in identifying any specimens that were sent to him, and to do all he could to help the Herbarium of the Provincial Museum.

Mr. Edward Nelson, who is the Chief of the Biological Survey, U.S. Department of Agriculture, Washington, D.C., and his staff gave much gratuitous help in determining many species of small mammals which could not be done in this Department, as it is necessary to have a large series to work on and to have the types close at hand.

Among the interesting specimens donated was a portion of a mammoth tusk which was presented by Mr. B. H. Lamont, Victoria, B.C. This was picked up at low tide on Island View Beach, Saanich Peninsula, opposite James Island, near Victoria. This is a tusk of one of the prehistoric elephants which had roamed throughout the northern portions of North America before the glacial period, and it is in a fairly good state of preservation. Several molar teeth of this extinct large prehistoric mammal have been taken in the vicinity of Victoria, one having been taken on James Island, another at Cordova Bay, and, more recently, fragments of one in the sand-pit at Mount Tolmie, near Victoria, B.C.

Another very interesting specimen was presented to the Provincial Museum by the Rev. R. Connell and Ira E. Cornwall—namely, a tooth of an extinct sirenian *Desmostylus* sp.? This is the second specimen of this kind which has been taken from the fossiliferous sandstone cliff near the mouth of Coal Creek, Sooke, V.I., on exhibition in the Provincial Museum, the first one having been found by Miss Egerton in the summer of 1916. (*See* An. Rep. Prov. Mus., page 42, 1916.)

PIED-BILLED GREBE. PODILYMBUS PODICEPS LINN.

[illegible]

ERRATA.

Page 9, line 29: For Stellar's Jay read Steller's Jay.

Page 9, line 32, Fox Sparrow (2): For (*Melospiza melodia*) read (*Passerella iliaca townsendi*).

Page 9, line 36, Song Sparrow (2): For (*Melospiza melodia*) read (*Melospiza melodia morphna*).

Page 9, line 37: For Western White-tailed Hawk read Western Red-tailed Hawk.

Mr. E. H. Blackmore, Associate Curator of Entomology, who is carrying on his systematic work in regard to the entomology of British Columbia, also arranged a new case of Diptera and Coleoptera on the upper floor of the Museum. Part of this collection originally belonged to the late Captain R. V. Harvey, of the University School, who was a well-known entomologist. Another case has been partly arranged and it is hoped to complete this in the near future, when final determinations have been made. The Entomological Report is appended and contains valuable information for those who are particularly interested in this branch of science.

ACCESSIONS.

Black Merlin (*Falco columbarius suckleyi*). Presented by Mr. Dennis Ashby, Duncan, B.C., March 23rd, 1923.

Black-headed Grosbeak (*Zamelodia melanocephala*). Presented by Mr. W. M. Mathewson, Mission City, B.C., June 12th, 1923.

Nest and four eggs of Chinese starling (*Acridotheres crista-tellus*). Presented by Mr. J. A. Munro, Victoria, B.C., June 4th, 1923.

Great Northern Diver Loon (*Gavia immer*). Presented by Mr. Dennis Ashby, Duncan, B.C., November 1st, 1923.

Dusky Horned Owl (*Bubo virginianus saturatus*). Presented by Mr. Dennis Ashby, Duncan, B.C., November 24th, 1923

Meadow-lark (*Sturnella magna neglecta*). Presented by Mr. Dennis Ashby, Duncan, B.C., November 24th, 1923.

Buffle-head Duck (*Charetonetta albeola*). Presented by Mr. Dennis Ashby, Duncan, B.C., November 27th, 1923.

The birds in the following list were presented by Mr. C. L. Kaufmann, Victoria, B.C., November, 1923:—

Herring Gull (*Larus argentatus*).
Glaucous-winged Gull (*Larus glaucescens*).
Sooty Shearwater (*Puffinus griseus*).
Northwestern Flicker (*Colaptes cafer collaris*).
Stellar's Jay (*Cyanocitta stellari stellari*).
Golden-crowned Sparrow (2) (*Zonotrichia coronata*).
Nuttal's Sparrow (*Zonotrichia leucophrys*).
Fox Sparrow (2) (*Melospiza melodia*).
Western Savannah Sparrow (*Passerculus sandwichensis alaudinus*).
Lutescent Warbler (*Vermivora celata lutescens*).
Chestnut-backed Chickadee (*Penthestes rufescens rufescens*).
Song Sparrow (2) (*Melospiza melodia*).

Western White-tailed Hawk (*Buteo borealis calurus*). Presented by Mr. Dennis Ashby, Duncan, B.C., December 3rd, 1923.

Leach's Petrel (*Oceanodorma leucorhoa*). Presented by J. Henly, Victoria, B.C., December 4th, 1923.

Bush-tits (4) (*Psaltriparus minimus minimus*). Presented by Mr. R. A. Cumming, Vancouver, B.C., December 19th, 1923.

Western Pine Grosbeak (*Pinicola enucleator?*). Taken at Point No Point, Renfrew District, February, 1923, and presented by Mr. J. G. French, December, 1923.

Arkansas Kingbird (*Tyrannus verticalis*). Taken at French's Beach, Renfrew District, February, 1923, and presented by Mr. J. G. French, December, 1923.

Nest and one egg of Clarke's Nutcracker (*Nucifraga columbiana*). Presented by Mr. J. A. Munro, Victoria, B.C., May 16th, 1923.

Eighteen eggs of European Partridge (*Perdix cinerea*). Presented by Mr. John Abelson, Victoria, B.C., June 28th, 1923.

Collection of eggs. Presented by Mrs. J. D. Jones, Victoria, B.C., November 30th, 1923.

Prickled Sailor-fish (*Blepsias cirrhosus*). Presented by Master Bernard Hunter, July 31st, 1923, Victoria, B.C.

Nudibranchiate sp.? Presented by Mr. Heritage, Victoria, B.C., October 30th, 1923.

Sponge, taken off the coast of Graham Island, Virago Sound, Q.C.I., 60 fathoms deep. Presented by Captain John Anderson, Victoria, B.C., September 30th, 1923.

Hair-worm (*Phreoryctes manheanus*). Presented by Mr. G. E. Seon, Kelowna, B.C., June 21st, 1923.

American Tiger Moth (*Arctia caja americana*). Presented by Master Tom Garvey, Victoria, B.C., August 9th, 1923.

Beetle (*Rhantus binotatus*). Found at Qualicum, V.I. Presented by Mr. W. H. Thornborrow, Victoria, B.C.

Trilobite from Mount Stephen, Field, B.C. Presented by Mrs. Stuart Armour, Cadboro Bay, B.C., November 2nd, 1923.

Portion of Mammoth Tusk found at Island View Beach, Saanich, B.C. Presented by Mr. B. H. Lamont, Victoria, B.C., June 28th, 1923.

Tooth of *Desmostylus* sp.? found near the mouth of Coal Creek, Sooke, V.I., and presented by Rev. R. Connell and Ira E. Cornwall.

Rubber Snake (boa) (*Charina bottæ*). Presented by Mr. Dick Spurway, Nelson, B.C., May 18th, 1923.

Stone Sinker. Presented by Mr. R. B. Halhed, Chemainus, B.C., May 7th, 1923.

Slate Spear-head. Presented by Mr. R. Deakin, Victoria, B.C., July 30th, 1923.

Stone Paint-dish. Presented by Miss Jean Kirk, Victoria, B.C., September 23rd, 1923.

Stone Battle-axe. Found by Mr. T. Wasilieff, Merville, B.C., September, 1923.

Rubbing-stone. Presented by Mr. T. W. S. Parsons, South Fort George, B.C., November 21st, 1923.

Arrow-point. Found at Fanny Bay, V.I. Presented by Mr. R. Cowie, September, 1923.

Two carved Goat-horn Spoons. Presented by Mr. T. W. Parsons, Prince Rupert, B.C., December, 1923.

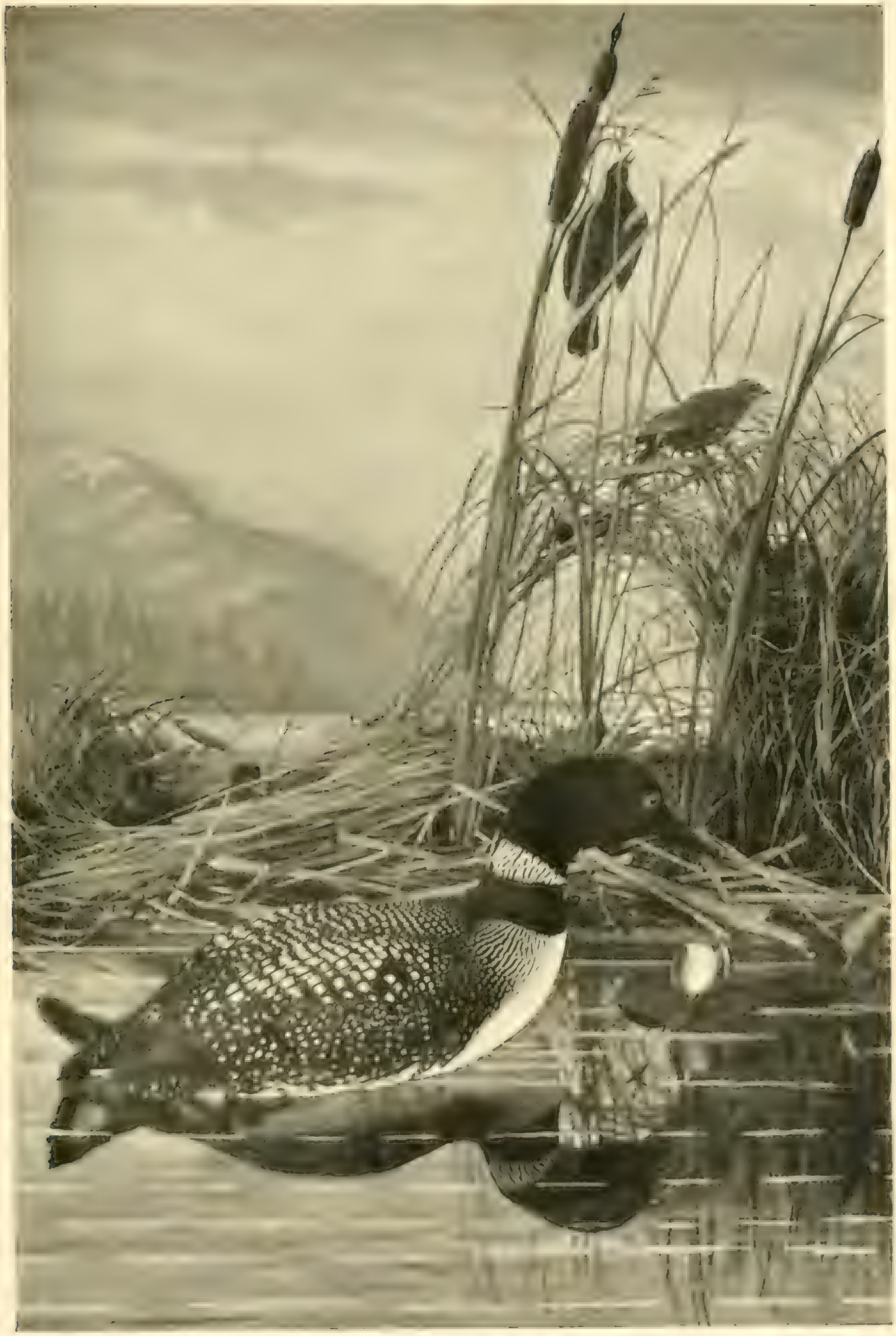
Stone Axe-head. Presented by Mr. T. W. Parsons, Prince Rupert, B.C., December, 1923.

Carved Whalebone Baton. Presented by Mr. T. W. Parsons, Prince Rupert, B.C., December, 1923.

PUBLICATIONS OF OTHER INSTITUTIONS.

(Alphabetically arranged.)

Acadian Entomological Society, Nova Scotia	1
American Museum of Natural History, New York	5
Augustana College Library, Rock Island, Ill.	1
Bernice Pauahi Bishop Museum, Honolulu, Hawaii	5
British Museum, London, England	2
Bristol Museum & Art Gallery, Bristol, England	1
California Academy of Sciences, San Francisco, Cal.	3
California University, Berkeley, Cal.	26
Cardiff Museum, Cardiff, Wales	2
Carnegie Museum, Pittsburgh, Pa.	1
Charleston Museum, Charleston, S.C.	3
Chicago Academy of Sciences, Chicago, Ill.	1
Cincinnati Museum Association, Cincinnati, Ohio	1
City Art Museum, St. Louis, Mo.	4
Colorado Museum of Natural History, Denver, Col.	1
Cooper Ornithological Club, San Francisco, Cal.	1
Cornell University, Ithaca, N.Y.	15
Dominion Government Publications	25
Field Museum, Chicago, Ill.	17
Grand Rapids Public Library, Mich.	1
Illinois State Natural History Survey, Urbana, Ill.	1
Insular Experimental Station, Rio Piedras, San Juan, P.R.	12
John Crerar Library, Chicago, Ill.	1
Library of Congress, Washington, D.C.	2
Lloyd Library	30
Manchester Museum, Manchester, England	1
McGill University, Montreal, P.Q.	1
Minnesota University, Minn.	1
Museum of the American Indian (Heye Foundation), New York	1
Carried forward	166



GREAT NORTHERN DIVER (GAVIA IMBER (GUNN.))
Group in Provincial Museum, Victoria, B.C.

Publications of other Institutions—*Continued.*

Brought forward	166
Museum of Fine Arts, Boston, Mass.	2
Nebraska University, Lincoln, Neb.	5
Newark Museum Association, Newark, N.Y.	2
New York Botanical Garden, N.Y.	1
New York State Museum, Albany, N.Y.	1
Ohio Agricultural Experiment Station, Wooster, Ohio	4
Oklahoma University, Norman, Okla.	2
Peabody Museum, Salem, Mass.	1
Peabody Museum, Yale University, New Haven, Conn.	15
Pennsylvania Museum and University	14
Province of British Columbia	3
Province of Alberta	1
Province of Nova Scotia	1
Province of Ontario	1
Public Museum, Milwaukee, Wis.	1
Roger Williams Park Museum, Providence, R.I.	2
Royal Ontario Museum, Toronto, Ont.	2
Smithsonian Institution, Washington, D.C.	22
Southwest Museum, Los Angeles, Cal.	4
Staten Island Institute, New Brighton, N.Y.	8
United States Department of Agriculture, Washington, D.C.	9
University of Washington, Seattle, Wash.	2
Wagner Free Institute of Science, Philadelphia, Pa.	1
Zoological Society, New York, N.Y.	1
Zoological Society, Philadelphia, Pa.	1
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BOTANY.

By W. R. Carter.

During the year 1923 many additions have been made to the Herbarium of the Provincial Museum, and the thanks of the Department are extended to the following collectors: Dr. C. F. Newcombe; Rev. R. Connell; Mr. G. V. Copley, of the Provincial Lands Grazing Department; Mr. W. B. Anderson, Dominion Inspector of Indian Orchards; Mr. A. H. Newcombe, and others, for specimens they have donated to the Herbarium.

Throughout the year the usual quantity of plants has been identified for school-children and other local collectors.

A small set of duplicate orchids was sent to the Rev. F. Stephenson, Ely, Cambridge, England, who is studying certain genera of this family. Specimens of our *Erythronium* were loaned to the University of Oregon, and a few specimens of Hepaticæ from the Herbarium were loaned to Mr. A. H. Brinkman, of Alberta, for examination; these specimens are part of the collection donated to the Provincial Herbarium by the late Professor John Macoun.

The thanks of this Department are most cordially extended to Professor C. V. Piper, Agrostologist, U.S. Department of Agriculture, Washington, D.C., and Dr. P. A. Rydberg, New York Botanical Garden, N.Y., for their kindness in identifying many specimens submitted to them.

The following lists, which give actual localities of specimens collected, will give some idea of the range of country traversed by the various collectors.

Plants of special interest collected and presented by Mr. W. B. Anderson:—

Equisetum sylvaticum L. Prince Rupert, B.C.
Scirpus pauciflorus Lightf. Prince Rupert, B.C.
Salix macrostachya Nutt. Agassiz, B.C.
Eriogonum subalpinum Greene. Paradise Valley, B.C.
Polygonum majus Piper. Lytton, B.C. (1922).
Cerastium Beeringianum C. & S. Paradise Valley, B.C.
Anemone Drummondii S. Wats. Paradise Valley, B.C.

Anemone parviflora Michx. Paradise Valley, B.C.
Coptis trifoliata (L.) Salish. Prince Rupert, B.C.
Ranunculus probably *R. alpeophilus* A. Nels. Paradise Valley, B.C.
Ranunculus saxicola Rydb. Paradise Valley, B.C.
Ranunculus vericundus Rob. Paradise Valley, B.C.
Arabis acutina Greene. Lytton, B.C.
Arabis Lyallii S. Wats. Paradise Valley, B.C.
Draba alpina L. Paradise Valley, B.C.
Draba alpina glacialis Adams. Paradise Valley, B.C.
Draba lonchocarpa Rydb. Paradise Valley, B.C.
Draba oligosperma Hook. Paradise Valley, B.C.
Draba prealta Greene. Paradise Valley, B.C.
Stenophragma Thalianum Celak. (*Arabidopsis*). Hazelton, B.C.
Rhodiola integrifolia Raf. Paradise Valley, B.C.
Sedum oreganum Nutt. Agassiz, B.C.
Saxifraga delicatula Small. Paradise Valley, B.C.
Geum calthifolium Menzies. Prince Rupert, B.C.
Rubus Chamæmorus Linn. Prince Rupert, B.C.
Astragalus alpinus L. ? Paradise Valley, B.C.
Astragalus Beckwithii T. & G. Kamloops, B.C.
Hypericum perforatum L. Chilliwack, B.C.
Lythrum Salicaria L. Chilliwack, B.C.
Epilobium alpinum L. Paradise Valley, B.C.
Andromeda Polifolia L. Prince Rupert, B.C.
Loiseleuria procumbens Desv. Prince Rupert, B.C.
Vaccinium oreophyllum Rydb. Paradise Valley, B.C.
Vaccinium scoparium Leiberg. Paradise Valley, B.C.
Vaccinium Vitis-Idæa L. Prince Rupert, B.C.
Androsace subumbellata (Nels.) Small. Paradise Valley, B.C.
Dodecatheon viviparum Greene. Prince Rupert, B.C.
Gilia minutiflora Benth. Spences Bridge, B.C.
Phlox rigida Benth. Fort Steele, B.C.
Phacelia idahoensis Henderson. Paradise Valley, B.C.
Galeopsis Tetrahit L. Agassiz, B.C.
Nicotiana attenuata Torr. Spences Bridge, B.C.
Castilleja crispula ? Piper. Paradise Valley, B.C.
Castilleja subcinerea Rydb. Windermere, B.C.
Linaria minor (L.) Desf. Agassiz, B.C.
Pentstemon albertinus ? Greene. Paradise Valley, B.C.
Symphoricarpos occidentalis Hook. Fort Steele, B.C.
Adoxa Moschatellina L. Hazelton, B.C.
Viburnum opulus americanum Ait. Adams Lake, B.C.
Antennaria luzuloides T. & G. Fort Steele, B.C.
Arnica aspera Greene. Mount Cheam, B.C. (1922).
Erigeron aureus Greene. Paradise Valley, B.C.
Erigeron compositus multifidus (Rydb.) Mack. & Payson. Paradise Valley, B.C.
Erigeron corymbosus Nutt. Fort Steele, B.C.
Erigeron minor (Hook.) Rydb. Fort Steele, B.C.
Eupatorium Bruneri A. Gray. Chilliwack, B.C.
Euthamia occidentalis Nutt. Keremeos, B.C.
Crepis elegans Hook. Golden, B.C.
Hieracium murorum L. Agassiz, B.C. (1922).
Solidago algida Piper. Mount Cheam, B.C. (1922).
Senecio ductoris Piper. Paradise Valley, B.C..

Plants of interest collected and presented by Mr. G. V. Copley:—

Agropyron caninum L. Kingsvale, Nicola, B.C.
Agropyron tenerum Vasey. Kingsvale, Nicola, B.C.
Deschampsia latifolia (Hook. & Scribn.). Mount Baldy, Bridesville, B.C.

Elymus Macounii Vasey. Douglas Lake, Nicola, B.C.
Festuca octoflora Walt. Kingsvale, Nicola, B.C.
Hierochloa odorata (L.) Wahlenb. Chimney Creek, Cariboo, B.C.
Oryzopsis exigua Thurb. Kingsvale, Nicola, B.C.
Panicum barbipulvinatum Nash. Vaseaux Lake, B.C.
Panicum pacificum Hitchc. & Chase. Vaseaux Lake, B.C.
Poa ampla Merv. Nicola, B.C.
Poa compressa L. Williams Lake, Cariboo, B.C.
Poa Fendleriana (Steud) Vasey. Nicola, B.C.
Sporobolus asperifolius (Ness & Meyen) Thurb. Vaseaux Lake, B.C.
Sporobolus contractus Hitchc. Marron Lake, B.C.
Spartina gracilis Trin. Douglas Lake, Nicola, B.C.
Stipa minor (Vasey) Scribn. Nicola, B.C.
Stipa occidentalis Thurb. Coldwater River, Kingsvale, B.C.
Stipa Richardsonii Link. Nicola, B.C.
Carex vespertina (Bailey) Howell. Mount Finlayson, V.I., B.C.
Carex nigricans C. A. Meyer. Mount Baldy, Bridesville, B.C.
Liparis Loeselii (L.) L. C. Rich. Nicola, B.C.
Eriogonum umbellatum Torr. Nicola, B.C.
Polygonum viviparum L. Nicola, B.C.
Atriplex hortensis L. Penticton, B.C.
Beta vulgaris L. Chimney Creek, Cariboo, B.C.
Chenopodium humile Hook. Meadow Lake, Lillooet, B.C.
Corispermum marginale Rydb. Alkali Lake, Lillooet, B.C.
Corispermum villosum Rydb. Deadman's Creek, Savana, B.C.
Suæda occidentalis S. Wats. Stump Lake, Nicola, B.C.
Aconitum columbianum Nutt. Osprey Lake, Princeton, B.C.
Actæa arguta Nutt. Nicola, B.C.
Ranunculus glaberrimus Hook. Grand Forks, B.C.
Alyssum alyssoides (L.) Gonan. Nicola, B.C.
Draba stenoloba Ledeb. Grand Forks, B.C.
Erysimum cheiranthoides L. Kane Valley, Nicola, B.C.
Lepidium campestre L. Mount Finlayson, V.I., B.C.
Radicula obtusa Nutt. Victoria, B.C.
Ribes cereum Dougl. White Lake, Penticton, B.C.
Mitella nuda L. Nicola, B.C.
Astragalus adsurgens Pall. Merritt, B.C.
Astragalus alpinus L. Nicola, B.C.
Astragalus glareosus Dougl. Kruger Mount, Okanagan, B.C.
Oxytropis deflexa D.C. Aspen Grove, Nicola, B.C.
Trifolium microcephalum Pursh. Mount Finlayson, V.I., B.C.
Trifolium microdon H. & A. Mount Finlayson, V.I., B.C.
Trifolium tridentatum Lindl. Mount Finlayson, V.I., B.C.
Geranium Richardsonii F. & M. Mamette Lake, Nicola, B.C.
Sphæralcia munroana Spach. Osoyoos, B.C.
Œnothera biennis (a form). Boundary Falls, B.C.
Lomatium Geyeri (S. Wats) C. & R. Rock Creek, B.C.
Arctostaphylos media Greene. Mount Finlayson, V.I., B.C.
Apocynum cannabinum L. Kettle Valley, B.C.
Convolvulus arvensis L. Lower Nicola, B.C.
Gilia Harknessii Curran. Nicola, B.C.
Lithospermum ruderale Lehm. Deadman's Creek, Savana, B.C.
Mertensia oblongifolia (Nutt.) Don. Rock Creek, B.C.
Stachys scopulorum Greene. Nicola, B.C.
Orthocarpus faucibarbatus Gray. Mount Finlayson, B.C.
Pedicularis bracteosa Benth. Big Bar Creek, Lillooet, B.C.
Rhinanthus Crista-galli L. Aspen Grove, Nicola, B.C.
Veronica xalapensis H.B.K. Vancouver Island, B.C.

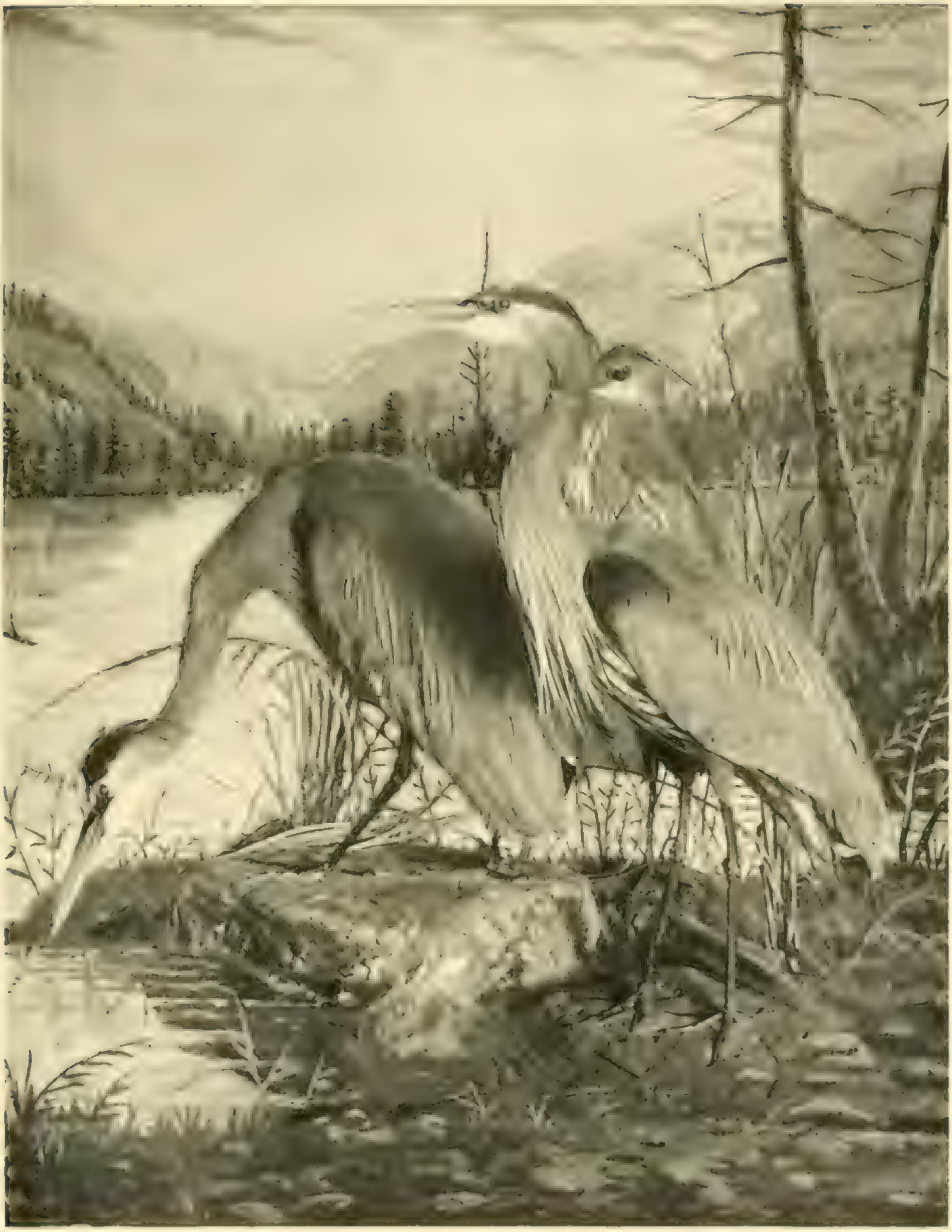
Agoseris scorzoneræfolia (Schrad) Greene. Merritt, Nicola, B.C.
Antennaria anaphaloides Rydb. Nicola, B.C.
Antennaria dimorpha T. & G. White Lake, Penticton, B.C.
Erigeron drœbachiensis Muell. Voght Valley, Penticton, B.C.
Erigeron lonchophyllus Hook. Douglas Lake, Nicola, B.C.
Hellianthella Douglasii T. & G. Nicola, B.C.

The following plants included in Mr. Copley's contributions are from just across the international United States boundary in the State of Washington:—

Purshia tridentata D.C.
Dodecatheon dentatum Hook.
Sphæralcia rivularis Torr.
Collomia aristella (A. Gray) Rydb.
Hydrophyllum albifrons Heller.
Pentstemon speciosus Dougl.

A very interesting collection of plants, principally from the Queen Charlotte Islands, was donated by Dr. C. F. Newcombe, 1923:—

Adiantum pedatum aleuticum Rupr. Lockeport, Q.C.I.
Asplenium viride Huds. Lockeport, Q.C.I.
Polypodium Scouleri Hook & Greville (collected in 1903). Ninstints, Q.C.I.
Lycopodium Selago ? L. Lockeport, Q.C.I.
Luzula campestris (L.) DC. Skidegate, Q.C.I.
Luzula parviflora (Ehrh.) Desv. Skidegate, Q.C.I.
Fritillaria camtschatcensis (L.) Ker-Gawl. Lockeport, Q.C.I.
Streptopus amplexifolius (L.) DC. Lockeport, Q.C.I.
Streptopus roseus Michx. Lockeport, Q.C.I.
Salix sitchensis ? (Sanson) Bong. Skidegate, Q.C.I.
Alnus sitchensis (Regel) Sarg. Skidegate, Q.C.I.
Cerastium viscosum L. (an addition to the Flora of Q.C.I.). Skidegate, Q.C.I.
Stellaria borealis var. *alpestris* (Gries) Gray. Goldstream, V.I., B.C.
Stellaria crispa Cham. & Schlecht (an addition to the Flora of Q.C.I.), Lockeport, Q.C.I.
Montia sibirica Howell. Lockeport, Q.C.I.
Aquilegia formosa Fischer. Skidegate, Q.C.I.
Caltha biflora DC. Skidegate, Q.C.I.
Ranunculus Bongardi Greene. Lockeport, Q.C.I.
Ranunculus occidentalis Nutt. Skidegate, Q.C.I.
Arabis hirsuta (L.) Scop. Skidegate, Q.C.I.
Barbarea vulgaris R. Br. Skidegate, Q.C.I.
Cardamine angulata Hook. Lockeport, Q.C.I.
Cardamine oligosperma Nutt. Limestone Island, Q.C.I.
Cochlearia officinalis Linn. Lockeport, Q.C.I.
Hemieva ranunculoides Raf. Bella Coola, B.C.
Tellima grandiflora Dougl. Lockeport, Q.C.I.
Ribes laxiflorum Pursh. Lockeport, Q.C.I.
Fragaria chiloënsis (L.) Duch. Skidegate, Q.C.I.
Rubus spectabilis Pursh. Lockeport, Q.C.I.
Hosackia americana (Nutt.) Piper. Oak Bay, Victoria, B.C.
Viola adunca Smith. Skidegate, Q.C.I.
Epilobium adenocaulon Haussk. Skidegate, Q.C.I.
Hippuris tetraphylla L. Bella Coola, B.C. (1922).
Œnanthe sarmentosa Presl. Lockeport, Q.C.I.
Osmorrhiza divaricata Nutt. Skidegate, Q.C.I.
Menziesia ferruginea Smith. Lockeport, Q.C.I.
Dodecatheon frigidum Hook. Limestone Island, Q.C.I.
Convolvulus Soldanella L. Saanichton, V.I., B.C.
Romanzoffia unalaschkensis Cham. Albert Head, V.I., B.C.
Castilleja pallida (L.) Spreng. Skidegate, Q.C.I.
Collinsia tenella Dougl. Skidegate, Q.C.I.
Rhinanthus Crista-galli L. Mount Douglas, Victoria, B.C.



NORTH-WEST COAST HERON ARDEA HERODIUS FANNINII (CHAPMAN

Group in Provincial Museum, Victoria, B. C.

Galium aparine L. Skidegate, Q.C.I.
Valerianella samolifolia (DC) Gray. Skidegate, Q.C.I.
Microseris Bigelovii Gray. Gonzales Hill, Victoria, B.C.
Prenanthes hastata (Pers.) Heller. Thurston Harbour, Q.C.I.

Plants collected and donated by Mr. A. H. Newcombe:—

Allium attenuifolium Kellog. Observatory Hill, Victoria, B.C.
Actaea spicata arguta Nutt. (addition to the Flora of Q.C.I.).

Plants collected and donated by Rev. R. Connell:—

Ranunculus acris L. Sandhill Creek, V.I.
Castilleja miniata Dougl. Sandhill Creek, V.I.
Scrophularia californica Cham. Alligator Creek, V.I.
Luina hypoleuca Benth. Muir Creek, V.I.
Prenanthes hastata (Pers.) Heller. Muir Creek, V.I.
Senecio triangularis Hook. Alligator Creek, V.I.

Other plants presented:—

Pseudotsuga mucronata Raf. Alberni, V.I., by J. Frank Thomson.
Gilia aggregata (Pursh) Spreng. Penticton, B.C., by W. Downes.
Artemisia frigida Willd. Penticton, B.C., by W. Downes.
Artemisia ludoviciana Nutt. Penticton, B.C., by W. Downes.
Hippuris tetraphylla L. Prince Rupert, B.C., by Harlan I. Smith.
Romanzoffia unalaschkensis Cham. William Head, V.I., by Ira E. Cornwall.
Hyosyamus niger Linn. Salmon Arm, B.C., by J. W. Gibson.
Datura Stramonium L. Saltspring Island, B.C., by P. de Noe Walker.
Lloydia serotina Reich. Wahleach Range, Agassiz, B.C., by F. Perry.

Plants which are supplementary additions to "The Flora of Vancouver and Queen Charlotte Islands, 1921 (introduced plants being printed in italics in conformity with the printing of the Check-list):—

Carex stenochlæna (Holm) Mackenzie. Mount Arrowsmith, V.I., July 26th, 1915. W. R. Carter.

Carex vulpinoidea Michx. Goldstream, V.I., July 1st, 1920. G. V. Copley.

Lepidium campestre L. Elk Lake watershed, May, 1923. Master Raven. Specimens also collected later, Mount Finlayson and Telegraph Bay, V.I., by G. V. Copley.

Scandix Pecten-Veneris L. Victoria, B.C., April 13th, 1923. G. V. Copley.

Centaurea maculosa Lam. Victoria, B.C., August 8th, 1921. W. R. Carter.

Crepis taraxacifolia Thuill. Mayne Island, B.C., June 20th, 1914. John Macoun.

ENTOMOLOGY.

By E. H. Blackmore, F.E.S.

The season of 1923 has been a most peculiar one from a collecting standpoint. Insects that are generally common have been very scarce, while others that have been regarded as somewhat rare have been taken in series.

Reports from many localities throughout Southern British Columbia all agree as to the remarkable absence of noctuid moths. This makes the third year in succession that the scarcity in this large family has been particularly noticeable.

The weather was exceedingly poor for collecting until the middle of July, as from the early spring until that time there were a great number of rainy days. The balance of the season right up to the end of the fall was very fine and dry, with a corresponding increase of insect-life, particularly amongst the Geometridæ.

The European satin-moth (*Stilpnotis salicis* Linn) still continues to spread, two or three specimens having been taken in Victoria by Mr. W. R. Carter, Assistant Biologist of the Provincial Museum, and a couple of individuals were captured by Captain J. Wise at Saanichton, B.C.

Acknowledgments.

The thanks of the Department are extended to the following specialists for their kindness in determining and verifying material submitted to them during the past season; Dr. W. Barnes, Foster H. Benjamin, Annette F. Braun, August Busck, Carl Heinrich, Dr. A. W. Lindsey, Dr. J. H. McDunnough, Wm. Schaus, and L. W. Swett.

BRITISH COLUMBIA INSECTS NEW TO SCIENCE.

The number of new insects described from British Columbia material as new to science during the year amount to forty-two species. They are divided between the following four orders: Lepidoptera, 16; Hymenoptera, 1; Diptera, 24; and Plecoptera, 1.

LEPIDOPTERA.

The sixteen species of Lepidoptera are distributed amongst the different families as follows: Lycænidæ, 2; Sphingidæ, 1; Noctuidæ, 3; Geometridæ, 1; Gelechidæ, 1; Olethreutidæ, 7; and Tortricidæ, 1.

Lycænidæ.

Plebius sæpiolus insulanus Blackmore. Described (Can. Ent., Vol. 55, page 98, April, 1923) from twenty specimens taken by the writer at Victoria, B.C., and Goldstream, B.C. This new race differs from typical *sæpiolus* in the much brighter blue of the male on the upper side and on the under-side by the clear bluish-white of the ground colour instead of greyish-white, as in the typical form. In the female the upper side of *insulanus* is an even dark brown with a few scattered blue scales basally, while typical *sæpiolus* is heavily shot with blue on both wings. Typical *sæpiolus* occurs at Atlin, B.C.

Plebius icarioides montis Blackmore. Described (*ibidem*, page 99) from eight specimens. Holotype, allotype, and four paratypes taken on Mount McLean, near Lillooet, B.C., by A. W. Hanham; one paratype from Mount Cheam, near Agassiz, B.C.; and one from Hope Mountains, B.C. (R. V. Harvey).

We now have three races of this Californian species in British Columbia—namely, *pembina* Edw., *blackmorei* B. & McD., and *montis* Blackmore. In the males *montis* differs from *pembina* in the much lighter shade of violaceous blue and in the narrower black border; from *blackmorei* by the totally different shade of blue, the latter being of a peculiar silvery blue; on the under-side it differs from *pembina* in the much lighter ground colour and in the lighter spotting of the fore wings, which, however, are much heavier than they are in *blackmorei*.

Since the above description was published I have seen three specimens of *montis* taken this year on a mountain near Lytton, B.C. It is evidently a high-altitude form.

These three races of *icarioides* Bdv. will now stand in our list as follows:—

Plebeius icarioides race *pembina* Edw. Southern British Columbia.
Plebeius icarioides race *blackmorei* B. & McD. Vancouver Island.
Plebeius icarioides race *montis* Blackm. Mountains of British Columbia.

Sphingidæ.

Sphinx mordecai McDunnough. Described (*ibidem*, page 148, June, 1923) from eleven specimens taken at Penticton, B.C. (W. B. Anderson), Wellington (G. W. Taylor), Vancouver (Livingston), Vernon (E. P. Venables), and Peachland (J. B. Wallis).

This is the species which has been known for so many years as *Sphinx vancouverensis* Hy. Edw. According to Dr. McDunnough's article, I understand that typical *vancouverensis* is the same insect that we have latterly been calling *perelegans* and which has been formerly recorded from various points in the Interior as *drupiferarum* (*vide* "The Sphingidæ of British Columbia," Blackmore, Pro. B.C. Ent. Soc., page 26, Feb., 1921).

Perelegans was described from "Big Trees, Calif.," by Hy. Edw. in Pro. Cal. Acad. Sci., Vol. V., page 109, 1874, and *vancouverensis* was described on page 111 of the same number from a single specimen taken by Dr. Bremner at Esquimalt, near Victoria, B.C. Dr. McDunnough is of the opinion that these two names may represent one species, but for the present proposes that the name *vancouverensis* be used in a racial sense.

This species is larger and darker than *mordecai* and presents other minor differences which renders separation easy.

In future our two species of this genus will stand as follows:—

Sphinx perelegans Hy. Edw.
    race *vancouverensis* Hy. Edw. Vancouver Island; Southern British Columbia.
Sphinx mordecai McD. Generally distributed throughout the Province.

Noctuidæ.

Euxoa lindseyi Blackmore. Described (Can. Ent., Vol. 55, page 214, Sept., 1923) from seven specimens—five taken by the writer at Victoria, B.C., and Goldstream, B.C., and two from the Barnes collection, one taken at Victoria, B.C., and one at Calgary, Alta.

Oncocnemis parvanigra Blackmore. Described (*ibidem*, page 215) from four specimens—three taken at Kaslo (J. W. Cockle) and one at Mount McLean (A. W. Hanham).

Litholomia napaca umbrifasciata Blackmore. Described (*ibidem*, page 216) from fifteen specimens taken by the writer at Victoria, B.C.

Further notes on the above will be found under " Illustrated Lepidoptera " and illustrations of each species on Plate V.

Geometridæ.

Enypia venata ab. *elaborata* Cassino & Swett. Described (Lepidopterist, Vol. IV., page 13, June, 1923) from a single male taken at Wellington, B.C., by the late Rev. G. W. Taylor on July 2nd, 1904.

This striking form differs from the type in having the fore wings pure white and the usual venular dots merged into a wide suffused black band. We may say here that *venata* is fairly common on Vancouver Island and is extremely variable both in coloration and markings. In the writer's series of about thirty specimens they range in colour from a light stone grey to a rich warm brown.

Gelechiidæ.

Gelechia trichostola Meyrick. Described (Exotic Microlepidoptera, Vol. III., page 22, June, 1923) from two specimens taken at Victoria, B.C., in September, 1919, by Dr. A. J. Turner, of Brisbane, Queensland.

I have a long series of previously undetermined *Gelechia* which I have identified as the above species. They were taken by the writer on various dates in March and September, and agree with the description in size, colour, and maculation. They were all taken at rest either on the trunk or the foliage of the scrub oak (*Quercus Garryana*). It is evidently a hybernating species.

The male measures 19 m.m. in expanse, with the female slightly smaller. It is brown in colour, irregularly suffused with dark fuscous irroration. On the fore wing is a small black linear mark beneath costa near the base, and an elongate black spot at the base of the inner margin; a few whitish scales between first and second discal dots and an angulated transverse streak of brown ground colour about three-quarters out from base. Hind wings grey, fringe pale grey. A distinguishing character in the male is a very long dark-grey pencil of hair underneath the hind wings, extending from base of costa to beneath posterior portion of cell.

Olethreutidæ (Eucosminæ).

Thiodia fertoriana Heinrich. Described (Revision No. Amer. Eucosminæ, Bull. 123, U.S.N.M., page 264, April, 1923) from three specimens taken at Goldstream, B.C., on May 10th, 1903.

The specimens were found amongst the undescribed material in the collection of Dr. Wm. Barnes, and although not bearing the collector's name were in all probability taken by Mr. A. W. Hanham, who collected in that district at that period.

Eucosma metariana Heinrich. Described (*ibidem*, page 133) from nine specimens—six taken at Shasta Retreat, Calif.; two at Hot Springs, Green River, Wash.; and one at Victoria, B.C. (Blackmore). (*See* " Illustrated Lepidoptera.")

Epiblema purpurissata Heinrich. Described (*ibidem*, page 149) from two specimens bred from wild rose at Vernon, B.C.

Epiblema periculosana Heinrich. Described (*ibidem*, page 268) from three specimens taken on Mount McLean, near Lillooet, B.C., by A. W. Hanham.

Epinotia digitana Heinrich. Described (*ibidem*, page 215) from two specimens—the type taken at Kaslo, B.C., by Dr. H. G. Dyar on July 28th, 1903, and the paratype taken by Professor C. V. Piper at Pullman, Wash. This is the same insect that had been determined by Kearfott as *transmissana* Walk. and is so listed in Dyar's Kootenai List and the Check-list of British Columbia Lepidoptera (1906).

Transmissana Walk. must now be removed from out British Columbia List and *digitana* Heinrich put in its place. *Digitana* is very close in colour and maculation to *nigralbana* Wals. The latter also occurs on Vancouver Island.

Epinotia meritana Heinrich. Described (*ibidem*, page 226) from thirteen specimens. The type and eight paratypes were reared from larvæ mining pine-needles by H. J. Peck, of the Utah Agricultural Experiment Station; the other four paratypes were taken by W. R. Carter at Victoria, B.C. The latter were found at rest on the trunks of Douglas fir (*Pseudotsuga mucronata*). This is a small species measuring from 10–11 mm. in alar expanse. The fore wings are white, banded and cross-lined with blackish fuscous; the hind wings are smoky fuscous, with shining lead-grey fringes. So far it has been found here in a very limited area.

Epinotia vagana Heinrich. Described (*ibidem*, page 230) from twelve specimens—five from Liaga, Wash.; five from Victoria, B.C. (Blackmore); one from Duncan, B.C. (Hanham); and one from Hoquiam, Wash. (*See* "Illustrated Lepidoptera.")

Tortricidæ.

Cacœcia columbiana McDunnough. Described (Can. Ent., Vol. 55, page 167, July, 1923) from a single female taken by Dr. W. R. Buckell at Salmon Arm, B.C.

HYMENOPTERA.

Tenthredinidæ (Saw-flies).

Dolerus nicæus MacGillivray. Described (*ibidem*, page 68, March, 1923) from a female specimen taken at Chilliwack, B.C. This new species of saw-fly is about 11 mm. in length, with the body entirely black and the head and thorax hoary. The wings are slightly smoky, with the veins and stigma black.

DIPTERA.

The arrangement and sequence of families and genera in the following list of new species is in accordance with Aldrich's "Catalogue of North American Diptera":—

Culicidæ (Mosquitoes).

Ædes hewitti Hearle. Described (Can. Ent., Vol. 55, page 5, Jan., 1923) from fourteen specimens, all taken at Yale, B.C., by the author. This new species is evidently very local, as although a survey of the mosquito fauna of the whole of the Lower Fraser Valley was undertaken by Mr. Hearle in 1919, Yale was the only locality wherein it was found.

Stratiomyidæ (Soldier-flies).

Stratiomyia discaloides Curran. Described (*ibidem*, Vol. 54, page 281, Dec., 1922) from three specimens—two taken at Chilcotin, B.C. (E. R. Buckell), and one at Kelowna, B.C. (M. H. Ruhmann).

Stratiomyia griseata Curran. Described (*ibidem*, page 283) from two specimens—type from Aspen Grove, B.C. (P. N. Vroom), and paratype from Lillooet, B.C. (A. W. Phair).

Therevidæ (Stiletto-flies).

Thereva brunnea Cole. Described ("Rev. Family Therevidæ," Pro. U.S.N.M., No. 2450, page 108) from nineteen specimens. The male type taken at Victoria, B.C., by W. Downes and the female allotype by W. B. Anderson at the same place. Paratypes were taken at Savary Island, B.C. (R. S. Sherman); Vancouver, B.C. (R. S. Sherman; R. C. Treherne); and Chase, B.C. (W. B. Anderson).

Thereva nigripilosa Cole. Described (*ibidem*, page 110) from three specimens—the type bred from larva at Victoria, B.C., by W. Downes and the paratypes collected by C. B. Garrett at Cranbrook, B.C.

Asilidæ (Robber-flies).

Eucyrtopogon (gen. nov.) *comantis* Curran. Described (Can. Ent., Vol. 55, page 116, May, 1923) from three specimens collected by E. R. Buckell—the type taken at Chilcotin, B.C., and the paratypes at Vernon, B.C.

*Eucyrtopogon spiniger*a Curran. Described (*ibidem*, page 117) from a single female specimen taken at Victoria, B.C., by R. C. Treherne.

Eucyrtopogon diversipilis Curran. Described (*ibidem*, page 118) from four specimens. Holotype and allotype taken at Chilcotin, B.C., by E. R. Buckell and two paratypes taken by C. Garrett at Banff, Alta.

Eucyrtopogon calcarata Curran. Described (*ibidem*, page 119) from ten specimens. The types were taken at Banff, Alta. (N. B. Sanson); the paratypes are from Cranbrook, B.C. (C. B. Garrett); Nicola, B.C. (P. N. Vroom); Aspen Grove, B.C. (Vroom); and Quilchena, B.C. (Vroom).

Cyrtopogon willistoni Curran. Described (*ibidem*, Vol. 54, page 277, Dec., 1922) from over 100 specimens from British Columbia. Holotype from Chilcotin, B.C. (E. R. Buckell), and allotype from Aspen Grove, B.C. (Vroom).

Cyrtopogon inversus Curran. Described (*ibidem*, Vol. 55, page 172, July, 1923) from six specimens. The male and female types were taken by P. N. Vroom at Aspen Grove, B.C., while the paratypes came from Darcy, B.C. (W. B. Anderson); Chilcotin, B.C. (E. R. Buckell); Nicola, B.C. (Vroom); and Hedley, B.C. (Anderson).

Crytopogon predator Curran. Described (*ibidem*, page 188, Aug., 1923) from a single female taken by W. B. Anderson at Fort Fraser, B.C.

Holopogon albipilosus Curran. Described (*ibidem*, page 207, Sept., 1923) from five specimens. Types and two paratypes taken by N. L. Butler at Vernon, B.C., and one paratype taken at Chilcotin, B.C., by E. R. Buckell.

Nicocles canadensis Curran. Described (*ibidem*, page 208) from five specimens. Holotype male from Saanich, B.C. (W. Downes); allotype female, Seattle, Wash.; paratypes, Royal Oak, B.C. (Treherne); Mount Douglas, B.C. (Downes); and Seattle, Wash.

Dolichopodidæ (Long-footed Flies).

Porphyrops grandis Curran. Described (*ibidem*, page 210) from two specimens taken by R. Glendenning at Agassiz, B.C.

Syntormon tricoloripes Curran. Described (*ibidem*, page 209) from four specimens taken at Cranbrook, B.C., by C. B. Garrett.

Scellus amplus Curran. Described (*ibidem*, page 73, March, 1923) from a single male taken by W. Downes at Saanich, B.C.

Syrphidæ (Flower-flies).

Pipiza atrata Curran. Described (*ibidem*, Vol. 54, page 283, Dec., 1922) from one male specimen taken by E. R. Buckell at Chilcotin, B.C.

Chilosia subchalybea Curran. Described (*ibidem*, Vol. 55, page 276, Dec., 1923) from two specimens taken at Cranbrook, B.C. (Garrett).

Platychirus peltatoides Curran. Described (*ibidem*, page 274) from six specimens. The male type from Penticton, B.C. (E. R. Buckell); female type from Vernon, B.C. (M. H. Ruhmann); and four paratypes taken at Penticton, B.C. (Treherne); Victoria, B.C. (W. B. Anderson); Royal Oak, B.C. (Treherne); and Ilwaco, Wash.

Leucozona lucorum var. *americana* Curran. Described (*ibidem*, page 38, Feb., 1923) from six specimens. Type male from Hull, Que.; type female from Metlakatla, B.C. (Rev. J. H. Keen); and four paratypes from Hull, Que.; Smith's Cove, N.S.; Chilcotin, B.C. (Buckell); and one, no data.

Tachinidæ (Caterpillar-flies).

Ginglimyia bicolor Curran. Described (*ibidem*, page 246, Oct., 1922) from four females taken by W. Downes at Saanich, B.C.

[illegible]

Lonchæa atritarsis Malloch. Described (Pro. Ent. Soc., Wash., Vol. 25, page 47, Feb., 1923) from a single male specimen taken at Kaslo, B.C., by A. N. Caudell.

Trypetidæ (Peacock-flies).

Eurosta solidaginis var. *subfasciatus* Curran. Described (Ent. News, Vol. 34, page 302, Dec., 1923) from seven specimens taken in British Columbia. Male and female types reared from Solidago galls by E. R. Buckell at Vernon, B.C.

Plecoptera (Stone-flies).

Nemoura cornuta Claassen. Described (Can. Ent., Vol. 55, page 285, Dec., 1923) from a single male specimen taken at Nanaimo, B.C. (Biological Station), by E. P. van Duzee.

Lepidoptera not previously recorded from British Columbia.

Fifteen species and races (excluding Microlepidoptera) have been added to the British Columbia list of Lepidoptera since last year's Provincial Museum Report was written. The numbers preceding the names are in accordance with those contained in Barnes & McDunnough's Check-list (1917).

Noctuidæ.

1270. *Euxoa feniscca* Harv. One specimen taken at Nicola Lake, B.C., by E. R. Buckell on August 24th, 1922. Described from California in 1875. The type is in the British Museum.

1283. *Euxoa excogita* Smith. A single specimen taken by T. A. Moilliet at Vavenby, B.C., on August 26th, 1921. Described in 1900 (Pro. U.S.N.M., Vol. 22, page 423) from ten specimens taken at Glenwood Springs, Colorado, by Dr. Barnes.

1289A. *Euxoa stigmatalis atrofusca* Sm. This is also a unique taken by Mr. Moilliet at Vavenby, B.C., on August 14th, 1921. Described (*ibidem*, page 447) as a distinct species from specimens taken in Colorado and at Pullman, Wash. It is now considered to be a variety of *stigmatalis* Smith.

1453. *Agrotis atrifrons* Grt. Two specimens—one taken by E. R. Buckell at Nicola Lake, B.C., on August 28th, 1922, and the other taken at Lillooet, B.C., by A. W. Phair on August 12th, 1917. The latter had been previously determined for us as *piscipellis* Grt. and was so listed in Ann. Rep. Prov. Mus., 1917, page 13. The two species are closely allied and very similar in appearance. Mr. Benjamin informs me that *piscipellis* has usually a more or less dark collar and the thorax seldom shows any definite line of black at the base of the teguhe, while *atrifrons* shows this line.

1517. *Apharetra pyralis* Sm. One specimen taken by L. E. Marmot at Maillardville, B.C., on August 15th, 1922. (*See* "Illustrated Lepidoptera.")

* *Lampra forbesi* Benjamin. Several specimens taken by Mr. G. O. Day at Quamichan Lake and Maple Bay, near Duncan, B.C. This species and *nefascia* are very closely allied and difficult to distinguish by superficial characters, but are easily separated by the genitalia, which are quite distinct. Mr. Benjamin made a slide of one of Mr. Day's specimens and it agrees in every particular with the type of *forbesi*. *Forbesi* was described (Bull. So. Calif. Acad. Sci., Vol. 20, page 98, Dec., 1921) from nine specimens, all taken in Utah.

1605. *Protagrotis obscura* B. & McD. Two specimens taken by Mr. E. R. Buckell at Nicola Lake, B.C., on July 29th, 1922.

1647. *Lasiestra phoca* Moesch. A short series taken on Mount McLean, near Lillooet, B.C., by Mr. A. W. Hanham in August, 1921. (*See* "Illustrated Lepidoptera.")

1905. *Orthosia mys* Dyar. Three specimens taken by Hon. J. G. Colville at Saanichton, October 17th to 20th, 1922. Described from California. This is an especially good capture and they are the first typical specimens taken in British Columbia. Mr. Day, of Duncan, took a single specimen many years ago which had been determined by Wolley Dod as this species, but it is in reality the form *coloramica* B. & McD., described from Arizona. The latter is considerably darker in colour on the primaries and secondaries have the veins outlined with reddish scaling.

2122. *Brachylomia populi* Stkr. One specimen taken at Seton Lake, near Lillooet, B.C., by Desmond Martin during the early part of August, 1923. (*See* "Illustrated Lepidoptera.")

2237. *Homoglæa hircina* Morr. A short series taken by Mr. T. A. Moilliet at Vavenby in March, 1922. (*See* "Illustrated Lepidoptera.")

2342B. *Oligia tonsa lævigata* Sm. Two specimens—one, a male, taken by E. R. Buckell at Nicola Lake, B.C., on July 18th, 1922, and the other, a female, taken at Saanichton, B.C., on July 7th, 1922, by Hon. J. G. Colville. It is rather strange that these two specimens, the only records that we have for the Province, should be taken in two entirely different faunal areas. Typical *tonsa* and the race *subjuncta* were illustrated on Plate III. of the Ann. Rep. Prov. Mus., 1921. The whole group is extremely rare in the Province.

Geometridæ.

4009. *Hydriomena nubilofasciata* Pack. and

4009a. *Hydriomena nubilofasciata raptata* Swett. Mr. W. R. Carter took a very long series of these geometers in a pine-woods near his home at Esquimalt (a suburb of Victoria, B.C.) during the latter end of February and the beginning of March of this year (1923). From February 26th to March 2nd 126 specimens were taken in excellent condition. The first batch of thirty-six specimens were taken on February 26th, between 8 and 9 p.m., resting on the underside of the lower pine-boughs. The weather was decidedly frosty, with about 3 inches of snow on the ground. The whole series showed a remarkable range of variation.

Mr. L. W. Swett kindly undertook to compare specimens with the types in the Packard and Swett collections and has succeeded in matching exactly the types of *nubilofasciata*, *vulnerata*, and *raptata*. There are also several intermediate forms and some specimens which do not agree with any of the published descriptions.

It is self-evident that the two latter names are not real geographical races, but simply forms of one very variable species.

4289. *Eufidonia notataria* Walk. Several specimens taken by Mr. W. B. Anderson at Prince Rupert, B.C., on May 23rd, 1923. (*See* "Illustrated Lepidoptera.")

Rare and uncommon Lepidoptera taken in British Columbia during 1923.

Victoria.—Very little of interest has been taken amongst the Macrolepidoptera during the season in this vicinity. Mr. W. R. Carter took a series of *Conoides plumogeraria* Hulst. at the end of March and noticed several *Erannis vancouverensis* Hlst. flying in November. The writer was fortunate enough to take four specimens of *Venusia obsoleta* Swett. in the first few days in May. This is the first time I have taken it and the first record for Victoria since the late Captain R. V. Harvey took it in 1908.

Saanichton.—During the season Captain J. Wise took some very nice geometers, including *Lygris harveyata* Tayl.; *L. atrifasciata* Hlst.; *Dysstroma sobria swetti* Blackm.; *Chlorosea nevadaria* Pack.; *Sabulodes cervinaria* Pack.; and *Eupithecia scabrogata* Pears. The latter are the first records of this species that I have had since Mr. T. Bryant took two specimens at Wellington, B.C., in 1903. The species is figured on Plate IV. of the Prov. Mus. Report for 1921.

Colwood.—A single specimen of *Tæniosea discivaria* Walk. was taken by the writer at rest on a tree-trunk. This is the first record for Vancouver Island.

Shawnigan Lake.—Mr. J. Clarke collected in this district for a few days in July and took a fine specimen of *Arzama obliqua* Walk., also a specimen in good condition of *Trachea impulsa* Gue. The latter is rare in collections.

Duncan.—Amongst Mr. A. W. Hanham's captures in this district the following are the most noticeable: *Catocala relicta* race *elda* Behr. (rare); *Autographa metallica* Grt.; *Olene styx* B. & McD. (rare); and *Cleora albescens* Hlst. (uncommon).

Maillardville.—Mr. L. E. Marmot took a perfect specimen of *Feralia deceptiva* B. & McD. (uncommon), a single specimen of *Cucullia florea* Grt. (rare), and two specimens of *Aplectoides occidens* Hamp. We are glad to get this latter record as it has been considered quite a rarity in the Province (*vide* Ann. Rep. Prov. Mus., 1921, page 31).

Seton Lake.—Master Desmond Martin spent July and August in this district, which is situated some 3 miles from Lillooet. He captured some very nice material, the best of the diurnals being *Strymon titus* Fabr. and *S. sæpium* Bdv., the former being especially rare. A specimen of *Tolype dayi* Blackm. was taken, which extends its known distribution. Amongst the Noctuidæ the following were the most desirable: *Agrotis oblata* Morr.; *Eriopyga perbrunnea* Grt. (rare); and *Catocala nevadensis* race *montana* Beut. In the Geometridæ a specimen of *Macaria bicolarata* Fabr. was taken; this is very rare in British Columbia. I have only seen two other specimens, one from Armstrong and one from Kaslo. *Itame denticulodes* Hulst. and *Plagodis approximaria* Dyar were also taken, both of which are rare in collections.

Vavenby.—The material collected in this locality by Mr. T. A. Moilliet and his son reflected the general conditions prevailing throughout the Province. Amongst the Geometridæ there was nothing of any special interest, but in the Noctuidæ there were several species which we are pleased to have. The following are the most desirable: *Heliothis phloxiphaga* G. & R.; *Anytus evelina* French (only previous record from the Province is Rossland); *Cryptocala gilvipennis*

Grt. (rare); *Scotogramma trifolii* Rott.; *Polia sutrina Grt.* (very rare on the Mainland); *Pyrrhia umbra experimens* Wlk.; and *Autographa orophila* Hamp. (rather rare). A fine specimen of *Pachysphinx modesta* Harris was also taken.

Marron Lake.—A few specimens were taken by Mr. C. deB. Green in the latter part of September; the two most desirable species being *Euxoa andera* Sm. and *Trachea mactata allecto* Sm., both of which are rather rare in collections.

Mr. W. B. Anderson, Dominion Inspector of Indian Orchards, states that although last year was a bad one from a collecting standpoint, this year was very much worse. Amongst the comparatively few species taken, the best were *Heodes cupreus* Edw., taken at Paradise, B.C., a mining camp in the Selkirk Range at an altitude of 7,300 feet and about 20 miles from Invermere. This brilliant "copper" butterfly has only previously been recorded in the Province from Mount McLean. A single specimen of *Apantesis parthenice* Kirby was taken at Invermere, B.C., *Melicleptria sueta* Grt. was taken at Chase, B.C. This latter species is very rare in the Province, our previous records being from Vaseaux Lake and the Hope Mountains.

MICROLEPIDOPTERA.

Owing to the extensive collecting done in this group during the previous three seasons, much of the material sent in was found to be a duplication of species already set up; consequently I only mounted some 880 specimens this season. However, many new records for the Province were discovered and series of hitherto rare species were taken.

Collections have been made at Victoria, Brentwood, Saanichton, Colwood, Goldstream, Shawnigan Lake, Duncan, Maillardville, Seton Lake, Marron Lake, and Yavenby.

The following list of species are new to the Province and are additional to those previously published in the Annual Reports of the Provincial Museum for 1920, 1921, and 1922. Included in this list are species taken in 1921 and 1922, but which have only recently been definitely determined.

The numbers and arrangements are in accord with Barnes & McDunnough's Check-list (1917), with the exception of the Eucosminæ, which are arranged according to Heinrich's "Revision of the Eucosminæ of North America" (1923).

Collectors: W. B. Anderson, E. H. Blackmore, E. R. Buckell, Dr. W. R. Buckell, W. R. Carter, J. Clarke, Hon. J. G. Colville, G. O. Day, C. deB. Green, A. W. Hanham, L. E. Marmont, T. A. Moilliet, and Captain J. Wise.

Pyralidæ.

5344. *Crambus præfectellus* Zinck. Adams Lake (W. R. B.).
5417. *Ommatopteryx ocellea* Haw. Nicola Lake (E. R. B.).
5474. *Jocara trabalis* Grt. Marron Lake (C. deB. G.).
5566. *Dioryctria ponderosæ* Dyar. Duncan (G. O. D.).
5631B. *Salebria virgatella inconditella* Rag. Shawnigan Lake (J. C.); Duncan (A. W. H.).
5670. *Epischnia albiplagiatella* Pack. Nicola Lake (E. R. B.).

Pterophoridæ.

5865. *Platyptilia marmarodactyla* Dyar. Revelstoke Mountain (W. R. B.).
* *Platyptilia mæa* B. & L. Fort Steele (W. B. A.).

Cosmopterygidæ.

5982. *Cystiœcetes nimbosus* Braun. Victoria (E. H. B.); Maillardville (L. E. M.).
6017. *Mompha murtfeldtella* Cham. Shawnigan Lake (J. C.); Duncan (A. W. H.); Maillardville (L. E. M.).

Gelechidæ.

6083. *Telphusa belangerella* Cham. Maillardville (E. H. B.).
6214. *Gelechia trophella* Busck. Saanichton (J. G. C.; J. W.).
6236. *Gelechia fluvialella* Busck. Salmon Arm (W. R. B.).
6263. *Gelechia versutella* Zell. Victoria (J. C.).
* *Gelechia trichostola* Meyr. Victoria (Dr. A. J. Turner; E. H. B.; W. R. C.).

Olethreutidæ (Eucosminæ).

6766. *Barbara colfaxiana siskiyouana* Kearf. Duncan (G. O. D.).
* *Thiodia fertoriana* Hein. Goldstream.
* *Eucosma metariana* Hein. Victoria (E. H. B.).
* *Epiblema purpurissatana* Hein. Vernon.
* *Epiblema gratuitana* Hein. Victoria (E. H. B.); Duncan (A. W. H.).
* *Epiblema periculosana* Hein. Mount McLean (A. W. H.).
7157. *Zeiraphera ratzeburgiana* Ratz. Victoria (E. H. B.; W. R. C.).
6954. *Epinotia miscana* Kearf. Mount McLean (A. W. H.).
* *Epinotia digitana* Hein. Kaslo (Dr. H. Dyar).
* *Epinotia meritana* Hein. Victoria (W. R. C.).
* *Epinotia vagana* Hein. Victoria (E. H. B.).

Olethreutidæ (Olethreutinæ).

6807. *Exartema quadrifidum* Zell. Chase (W. B. A.); Duncan (A. W. H.).
6819. *Olethreutes deceptana* Kearf. Victoria (A. W. H.).
/ 6833. *Olethreutes chalybeana* Wals. Shawnigan Lake (J. C.).

Tortricidæ.

7366. *Cacœcia pallorana* Rob. Duncan (A. W. H.).
* *Cacœcia columbiana* McD. Salmon Arm (W. R. B.).
7415. *Peronea oxycoccana* Pack. Maillardville (L. E. M.).

Phalonidæ.

7543. *Hysterosia waracana* Kearf. Duncan (G. O. D.; A. W. H.).
7544. *Hysterosia cartwrightana* Kearf. Vavenby (T. A. M.).

Glyphipterygidæ.

7605. *Allononyma diana* Hub. Goldstream (A. W. H.).

Yponomeutidæ.

7684. *Argyresthia quadristrigella* Zell. Victoria (W. R. C.); Saanichton (J. G. C.).
7708. *Argyresthia pedmontella* Cham. Victoria (W. R. C.); Brentwood (E. H. B.).
7710. *Argyresthia mesocausta* Meyr. Victoria (E. H. B.).

Gracilariidæ.

7894. *Lithocolletis basistrigella* Clem. Victoria (E. H. B.; W. R. C.).
7906. *Lithocolletis alnicolella* Wlsm. Maillardville (L. E. M.).
7911. *Lithocolletis scudderella* F. & B. Victoria (E. H. B.); Maillardville (L. E. M.).
7928. *Lithocolletis fragilella* F. & B. Victoria (E. H. B.); Saanichton (J. G. C.); Maillardville (L. E. M.).
7942. *Lithocolletis hamadryadella* Clem. Victoria (E. H. B.; W. R. C.).
8011. *Parectopa salicifoliella* Cham. Vavenby (T. A. M.).
8013A. *Ornix guttea solitariella* Dietz. Victoria (E. H. B.).
Gracilaria syringella Fab. Maillardville (L. E. M.).

[illegible]

* *Epermenia alameda* Braun. Duncan (A. W. H.).

Lyonetiidæ.

8125. *Bucculatrix canadensisella* Cham. Victoria (E. H. B.; W. R. C.); Maillardville (L. E. M.).
8135. *Bucculatrix pomifoliella* Clem. Maillardville (L. E. M.).

Tineidæ.

8223. *Scardia anatomella* Grt. Vavenby (T. A. M.).
8268. *Tinea niveocapitella* Cham. Saanichton (J. G. C.).

Nepticulidæ.

8373. *Nepticula latifasciella* Cham. Victoria (E. H. B.; W. R. C.).
8383. *Nepticula pomivorella* Pack. Victoria (E. H. B.).
8401. *Nepticula diffasciæ* Braun. Victoria (E. H. B.; W. R. C.).

ILLUSTRATED LEPIDOPTERA (PLATE V.).

Noctuidæ.

* *Euxoa lindseyi* Blackmore. This new species is rather uncommon, as I have only taken five specimens in twelve years' collecting on the Island. The ground colour is cinereous grey, with sparse fuscous markings. It is closely allied to *catenula* Grt., which occurs on the Mainland.

1328. *Euxoa murdocki* Smith. A single specimen of this rare species was taken by Mr. E. R. Buckell at Nicola Lake, B.C., on August 24th, 1922. I have only seen one other specimen from British Columbia (taken by Mr. A. W. Phair at Lillooet). The species is recorded in our Check-list from "B.C.," but Smith's North-west British Columbia really meant Alberta, in the vicinity of Red Deer and Edmonton. The above two specimens are the only authentic British Columbia records.

1517. *Aphareta pyralis* Sm. This species is a new record for British Columbia and was taken by Mr. L. E. Marmont at Maillardville on August 15th, 1922. It is a very interesting capture and was originally described (Ent. News, Vol. 7, page 26, 1896) from two specimens taken by the late F. H. Wolley Dod at Calgary, Alta.

1647. *Lasiestra phoca* Moesch. A short series taken by Mr. A. W. Hanham at Mount McLean in August, 1921. It had been confused with the race *lutcola* Sm. taken at the same time and place, but it is consistently smaller and differs in minor particulars, especially on the under-side of the secondaries. *Phoca* was described from Labrador in 1864 and it also occurs in Colorado.

* *Oncocnemis parvanigra* Blackm. The first specimen of this new species was taken by Mr. J. W. Cockle at Kaslo on August 12th, 1909. No further specimens were captured until 1921, when Mr. Cockle took another one on August 6th, and Mr. Hanham captured one on Mount McLean on August 14th of the same year. The only male specimen was also taken by Mr. Cockle on August 10th, 1922. It is close to *tenuifascia* Sm.

2122. *Brachylomia populi* Strecker. A beautiful specimen of this species was taken last August by Desmond Martin at Seton Lake, near Lillooet. This is the first record that we have of this species from British Columbia, although it has been recorded from Calgary and Red Deer, in Alberta. It was originally described from Colorado.

* *Litholomia napaea* race *umbrifasciata* Blackm. This is our common Vancouver Island form, which is quite distinct from typical *napaea*, the latter also occurring in the Interior of British Columbia. In *umbrifasciata* the ground colour is a greyish-white and has a contrasting dark-brown median band, while in *napaea* the colour is dark grey, with the maculation somewhat obscured. It is also consistently larger.

2223. *Parastichtis decipiens* Grt. The specimen figured was taken by Dr. W. R. Buckell at Salmon Arm. The species must be very local as we have no record of it from any other locality. *Decipiens* was described from Indiana in 1881. It is closely related to *P. acta* Grt., which is common on Vancouver Island in the late fall.

2237. *Homoglaea hircina* Morr. A short series of this species, which is new to the Province, was taken by Mr. T. A. Moilliet at Vavenby at the end of March, 1922. It is variable in colour, but does not differ materially from Eastern specimens. It is considerably smaller than either *H. carbonaria* Haw. or *H. dives* Sm., both of which occur in British Columbia, the former on the Mainland and the latter on Vancouver Island.

Notodontidæ.

3652. *Ianassa semirufescens* Wlk. The specimen illustrated was taken by Mr. L. E. Marmont on July 12th, 1923. It is rather a rare species in the Province. In the 1906 Check-list *I. semirufescens* var. *perangulata* Hy. Edw. is recorded from Wellington and Kaslo, and I strongly suspect that these records refer to *semirufescens*. *Perangulata* is now treated as a distinct species, although very similar superficially.

PLATE V.

NOCTUIDÆ NOTODONTIDÆ GEOMETRIDÆ

Euxoa lindseyi Blackm.
(Allotype female.)
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Litholomia napæa umbrifasciata Blackm.
(Partoype male.)
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Ianassa semirufescens Walk.
Fraser Mills, B.C. (L. E. Marmont).
(Rather rare.)

Brachylomia populi Stkr.
Seton Lake, B.C. (D. Martin).
(New to British Columbia.)

Homoglæa hircina Morr.
Vavenby, B.C. (T. A. Moilliet).
(New to British Columbia.)

Parastichtis decipiens Grt.
Salmon Arm, B.C. (W. R. Buckell).
(Very local.)

Apharetra pyralis Sm.
Fraser Mills, B.C. (L. E. Marmont).
(New to British Columbia.)

Lasiestra phoca Moesch.
Mount McLean, B.C. (A. W. Hanham).
(New to British Columbia.)

Euxoa murdocki Sm.
Nicola Lake, B.C. (E. R. Buckell).
(Very rare.)

Oncocnemis parvanigra Blackm.
(Allotype female.)
Kaslo, B.C. (J. W. Cockle).
(New to science.)

Eufidonia notataria Walk.
Prince Rupert, B.C. (W. B. Anderson).
(New to British Columbia.)

MICROLEPIDOPTERA.

Ommatopteryx ocellea Haw.
Nicola Lake, B.C. (E. R. Buckell).
(New to British Columbia.)

Scardia anatomella Grt.
Vavenby, B.C. (T. A. Moilliet).
(New to British Columbia.)

Salebria virgatella inconditella Rag.
Shawnigan Lake, B.C. (J. Clarke).
(Rather rare.)

Evergestis insulalis B. & McD.
Saanichton (J. Wise).
(Uncommon.)

Dioryctria ponderosæ (Dyar).
Quamichan Lake, B.C. (G. O. Day).
(New to British Columbia.)

Eucosma metariana Hein.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Exartema quadrifidum Zell.
Chase, B.C. (W. B. Anderson).
(New to British Columbia.)

Epinotia vagans Hein.
Victoria, B.C. (E. H. Blackmore).
(New to science.)

Gelechia trophella Busck.
Saanichton (J. C. Colville).
(New to British Columbia.)

Epicallima coloradella Wlshm.
Victoria, B.C. (W. R. Carter).
(Rather rare.)

Geometridæ.

4289. *Eufidonia notataria* Wlk. Several specimens of this pretty little geometer were taken by Mr. W. B. Anderson on May 23rd, 1923, at Prince Rupert. This is the first record of this species in British Columbia, although it occurs in Alberta and eastward to the Atlantic Coast.

Pyralidæ.

4992. *Evergestis insulalis* B. & McD. The specimen illustrated was taken by Captain J. Wise at Saanichton on July 2nd, 1923, and although the species occurs regularly but sparingly on Vancouver Island, it is very seldom that a specimen is taken in such fine condition. The species was described (Cont. Lep. No. Amer., Vol. 2, page 229, Aug. 1914) from specimens taken at Duncan and Victoria.

5417. *Ommatopteryx ocellea* Haw. This exceedingly delicate species was taken by Mr. E. R. Buckell at Nicola Lake on July 18th, 1923, and is a new record for the Province. It is a native of the Mediterranean coasts and has been accidentally imported into a number of countries, including Asia, Africa, North America, and Australia.

5566. *Dioryctria ponderosæ* Dyar. This is another new record for the Province and was taken by Mr. G. O. Day at Quamichan Lake, near Duncan. It must be very rare as well as local, Mr. Day having only taken two specimens in sixteen years' collecting, and we have no other record.

5631b. *Salebria virgatella inconditella* Rag. The specimen illustrated was taken by Mr. J. Clarke at Shawnigan Lake on July 14th, 1923, and is new to our list. Mr. A. W. Hanham also took a specimen, but not in such good condition, at Quamichan Lake late in July.

Gelechiidæ.

6214. *Gelechia trophella* Busck. A short series of this rather striking gelechid was taken by Hon. J. G. Colville at Saanichton during June, 1922, and two specimens were taken by Captain Wise in June of this year at the same place. We have not seen it from any other locality. It was described (Pro. U.S.N.M., Vol. 25, page 860, 1903) from Platte Canyon, Colorado. The larvæ were found feeding on oak.

Œcophoridæ.

6492. *Epicallima coloradella* Wlsm. Mr. W. R. Carter took a short series of this species during the past summer. It has always been considered somewhat of a rarity in British Columbia collections. It has been previously recorded from Kaslo (Cockle) and I have seen one specimen taken at Duncan by Mr. Day.

Olethreutidæ.

6807. *Exartema quadrifidum* Zell. This pretty grey and maroon species was taken by Mr. W. B. Anderson at Chase on July 18th, 1923. A specimen was also taken in June by Mr. Hanham at Quamichan Lake. It is a new record for the Province.

* *Eucosma metariana* Heinrich. The ground colour of this new species is white, with brown lines and spots, and it measures about 14 mm. in alar expanse. It is not at all common, as I have only taken three or four specimens in as many years, including the paratype. It occurs in July, and as far as I know is very local. I have only found it in one very small area.

* *Epinotia vagana* Hein. This new species is rather striking in colour, the costal half of the fore wings being a bright purplish red. It measures about 18 mm. in alar expanse. The larvæ feed on wild crab-apple and the adult flies in August and September. Described in part from five specimens taken by the writer at Victoria and one specimen taken by Mr. Hanham at Duncan.

Tineidæ.

8223. *Scardia anatomella* Grt. A single specimen of this species, which is a new record for the Province, was taken by Mr. T. A. Moilliet at Vavenby on June 8th, 1923. It is a very striking species and was originally described from New York in 1882.

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